THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
January 16, 1989 · Vol. XXIII · No. 2 · 118 Pages · $2/Copy · $44/Year

COMPUTERWORLD

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Despite 3990 delays, IBM's high-end storage controller wins early user endorsements. Page 27.

Court: States may tax net traffic

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A U.S. Supreme Court ruling last week will allow states to tax interstate voice and data traffic.

With several states having already enacted such taxes and others desperately seeking new sources of revenue, the decision could raise the cost of business communications and affect the location of data centers.

The decision upheld an Illinois law imposing a 5% excise tax on interstate voice and data transmissions that begin or end in the state. Approximately a dozen states have similar taxes, and more states are expected to follow suit.

Axed with taxes

Illinois collected $142 million in taxes by mid-1987 and continues to collect revenue at a rate of $10 million per month from business and residential users, according to a court filing.

Business network managers, especially those with high-volume transaction networks such as airline reservation systems, may wind up moving their data centers to "tax haven" states that do not impose telecommunications taxes, according to experts.

"This will definitely affect site-location decisions," said Kenneth L. Phillips, vice-president of telecommunications policy at Citicorp in New York and chairman of the Committee of

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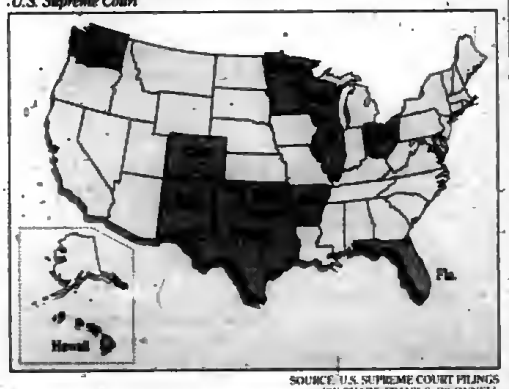
Revenue enhancers

A dozen states already have some form of tax on interstate telecommunications, and more are expected to follow as a result of last week's green light from the U.S. Supreme Court



SOURCE: U.S. SUPREME COURT FILINGS
CW CHART: FRANK C. O'CONNELL

On SQL Server's test trail

BY DOUGLAS BARNEY
CW STAFF

A glaring shortage of front-end development tools and the lack of a finished product has not stopped a handful of the U.S.' largest corporations from hatching SQL Server applications.

SQL Server, announced one year ago by Ashton-Tate Corp., Microsoft Corp. and Sybase, Inc., is a multiuser database engine designed for the OS/2 operating system.

It implements the so-called client/server architecture, under which a server handles data management while users' workstations provide the interface or front end.

Users who are anxious to get cracking have been forced to buy the $1,995 Network Development Kit, which is essentially a beta-test version of the software.

Of the 800 units sold, some 200 to 250 have been snapped up by corporations, according to Microsoft SQL Server product manager Dave Kaplan.

System One Airplane Services, a subsidiary of Texas Air Corp., already has a prototype application running under SQL Server, and the results are promising. Curt L. Abraham,

Continued on page 6

NAS deal brings new lineup to plug-compatible market

BY JEAN S. BOZMAN
and CLINTON WILDER
CW STAFF

SANTA CLARA, Calif. — Months of uncertainty for users of National Advanced Systems CPUs came to an end last week with National Semiconductor Corp.'s sale of 50% of its mainframe unit to Memorex Telex N.V.

After dozens of rumors about the potential sale, the deal — a total package estimated at between $300 million and $350 million — appears to guarantee continuity for customers, at least in the near term. NAS management will stay in place, and no work force reductions are anticipated, a NAS spokeswoman said. But with Memorex Telex obtaining an option to buy out all of National Semiconductor's stake at an unspecified future date, further changes could occur.

"National obviously is headed in a different direction than they were before, but we're encouraged that they kept half the company," said Richard Lester, vice-president of corporate development at Seattle-based Associated Grocers, Inc., which runs a NAS AS/XL 60 and 90/60. "We've done business with Memorex [for several years], and we're very comfortable with them."

Continued on page 8

Chip prices drop; PC prices don't

BY WILLIAM BRANDEL
CW STAFF

While several vendors used memory costs as an excuse to hike personal computer prices last year, no one is yet promising to bring them down now that the shortage is over.

According to memory-card product vendors and industry analysts, dynamic random-access memory chips are now increasingly available, and prices are dropping. Prices of 1M-bit chips are projected to plummet more than 50% by year's end.

Already, the volume purchase price of 1M-bit chips has dropped to less than $20 per chip. When the memory crisis peaked in June, the price hovered at $50 to $60. Semiconductor price trackers now project that chip prices will fall below $10 this year.

But vendors that raised system prices during the dearth — including Apple Computer, Inc.,

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When the chips come down

With availability increasing, the price for 1M-bit memory chips has dropped slightly in recent months and is expected to plummet

SOURCE: DATAQUEST, INC.
CW CHART: JOHN YORK

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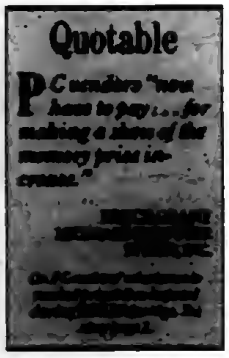

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NEWS

Unisys microsizes it

Announces desktop extension of A architecture

BY ROSEMARY HAMILTON
CW STAFF

Unisys Corp. will bring its mainframe down to the desk top this week with the announcement of a microcomputer-size extension of its A series mainframe architecture.

Scheduled for a Wednesday announcement, the desktop system, which sources said has been dubbed the Micro A, will establish a new mainframe entry point for Unisys. It is intended to lure potential small-business customers and to prevent existing A series customers from looking elsewhere for an intelligent desktop device, industry observers said.

Sources said last week that the system will have a stripped-down price of about $20,000. With the added cost of software and peripherals, the system will actually be in the $40,000 range. That pricing scheme puts the system in a league with the low end of IBM's Application System/400.

A+ series

A Unisys spokesman confirmed that the system is an extension of the A series, which comes from the Burroughs side of the house. He said the micro-mainframe is based on proprietary A series technology that packs 10 million transistors onto a 2-in. chip, known as the Scamp.

The system, although desktop-size, will have "all the traditional attributes of a mainframe" such as extended memory, advanced communications capabilities and the ability to drive substantial I/O, the spokesman said. One A series user said the system will have eight data communications lines.

It will also be fully software compatible with the other members of the A series line, which operate under the MCP/AS operating system, the spokesman added. The system will likely run Unisys fourth-generation languages Linc and Mapper, a source added.

Analysts contacted last week said the Micro A is a sound move because it responds to users' demands for more power on the desk top.

"This will help offload things from the mainframe and match applications to the processing power available," said Jeffry Beeler, an analyst at Dataquest, Inc.

Michael Geran, vice-president of research at Nikko Securities Co. International in New York, said the company decided to implement a desktop system on the A series side before doing so with the former Sperry line because it was behind schedule with other smaller Sperry systems. Also, the company determined that there would be more demand on the A series side since these models "are smaller to begin with so customers are more interested in price," Geran said.

Robert Moran, Computerworld's Mid-Atlantic correspondent, contributed to this report.

Computer firms sign up for new TV technology

BY NELL MARGOLIS
CW STAFF

SANTA CLARA, Calif. — IBM, Digital Equipment Corp., Apple Computer, Inc. and Hewlett-Packard Co. are among 16 leading U.S. firms that gathered in Las Vegas last week and decided to bet on the U.S. in the coming wave of television technology.

The companies are pitching in to draw up a business plan for a for-profit U.S. venture whose mission will be to garner "a majority of the hardware markets associated with an anticipated U.S. high-definition television business," according to a statement issued by the American Electronics Association (AEA).

High-definition television (HDTV), a next-generation technology that promises viewers clearer pictures and promises vendors bigger pictures on their balance sheets, is already under development by government-funded consortiums in Europe and Japan; the U.S., however, has been slow to enter the vaunted new market.

The HDTV cause has become critical for both the U.S. military and electronics industries, which argue that the technology needed to develop HDTV is crucial to the further development of semiconductor and other electronic technologies.

According to the AEA announcement, the limited partnership formed will aid the U.S. government in funding, developing and managing at least one HDTV consortium, licensing the resultant technology to other domestic companies, and directing technology to HDTV and related product manufacturing.

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A Super Bowl tie?

PC predicts sudden death in Bengals-49ers clash

BY BRUCE HOARD
SPECIAL TO CW

I've known Bud Goode for eight years. We've collaborated on a lot of Super Bowl stories. And let me tell you, Dick Buthus is no Bud Goode. Nor, for that matter, is Brent Musburger, Irv Cross or any of them. Bud stands alone among pigskin prognosticators.

After all, he and his computer have picked the past two Super Bowl winners. And thus far, they are six out of eight in this year's National Football League playoffs. Even if they were last among this year's regular stable of 10 *New York Post* forecasters, they finished first in 1987. So this Bud'a for me.

Having said that, let me tell you that he threw me a curve when I called him for the low-down on Super Bowl XXIII. Instead of boldly hemming and hawing and saying how you just can't count on the computer to pick the winner of a football game, he came right out with his forecast, naysayers be damned.

A tie.

Imagine that. A tie. No winner. Too close to call.

I felt like telling Bud that the imperious, cigar-smoking editors at *Computerworld* would throw me off the sports beat if I came to them with a story calling for a tie in the Super Bowl. But I didn't. Instead, I said, "OK, Bud, then what's your gut feeling?"

Before he answered, I heard the sound of rustling readouts. Or maybe it was the sports page. The latest line picks San Francisco by seven points. Finally, he spoke: "I'm gonna take Cincinnati and the seven."

There is, of course, a computer-based method to his madness. Each week during football season, he massages more than 170 variables per page three different ways as part of a 60-page readout he currently sells to the head coaches of nine NFL teams. And he loves the graphics he'a able to produce with his new Hewlett-Packard laser printer. Bucking the trend in linebackers of late, Bud'a been downsizing. His Franklin AT is the latest step in a genealogy of hardware that'a seen him go through a Sperry 1100 and an IBM 4381.

Offensive balance

Turning to the 49ers-Bengals matchup, he talked about the statistical strength of both teams' offenses. Bud dedicates 50 variables to the clash of offense and defense. "On the first 16 statistics, San Francisco has an advantage over Cincinnati'a defense," he reported. "And on the first 17 statistics, Cincinnati's offense has the advantage over San Francisco'a defense."

These statistics, amassed during the regular season and playoffs, include passing efficiency, fumbles allowed and yards per pass attempt.

When Bud weighed out the whole mix with his PC, the outcome was so close it was a wash statistically. And he is loath to contradict it. "I never want to go against the computer, because when I do, I'm wrong nine times out of 10," he noted.

If the game is tied and time is waning midway through the fourth quarter, what does he predict? If the Bengals have the ball, they will try to eat up the clock by running fullback Ickey Woods behind their leviathan offensive line. If the 49ers have it, they will run and simulate the run with short, safe "dump-off" passes to running backs such as Roger Craig.

Bud does not like to think his game has fallen off. And he has little respect for some of his emerging, computer-based forecasting competition. "The last one I saw was in *USA Today*, and I burst out laughing," he said. "I don't think they know what they're doing."

If that'a the way Bud feels, I agree.

Hoard is former editor of *Network World*, an IDG Communications publication, and a former *CW* staff member.

Bengals' Esiason *can beat the computer spread*

MIS shies from second-tier PCs

BY CLINTON WILDER
CW STAFF

The MIS executive's short personal computer list is getting shorter.

Spurred by more sophisticated PC applications and the desire for control over their organization's PC proliferation, corporate information systems departments are narrowing their approved PC vendor choices. And the trend, which is expected to accelerate in 1989, will mean success on the corporate desk top for top-tier vendors IBM, Compaq Computer Corp. and Apple Computer, Inc. and tough times for lower priced compatible vendors such as Wyse Technology, Tandon Corp. and AST Research, Inc.

The trend, MIS directors say, is spurred by the emergence of more powerful PCs as the platform for critical, make-or-break business applications once entrusted to minicomputers. "If I'm using a PC as the central communications controller for a warehouse management system, I'm going to be very careful about where that machine comes from," said Richard Lester, vice-president of corporate development at Associated Grocers, Inc. in Seattle.

Portland, Ore., steel maker American Industries, Inc. says it is happy with its turnkey Wyse system for computer-aided design and manufacturing applications. But for future purchases, MIS director Larry Potter's edict is IBM Personal System/2s or Compaq compatibles.

"I don't have a complaint in the world about Wyse," Potter said. "They're just not one of the major players that I think about."

Chris Kryzan, product marketing manager for PCs at San Jose, Calif.-based Wyse, responded that in large corporate accounts, there is room for the Big Three of IBM, Apple and Compaq, plus "a fourth compatible, low-cost alternative. . . . Our strategy is to become that fourth brand."

Financial analysts expect to see the trend reflected in computer industry fourth-quarter results to be announced this week. Apple and Compaq are expected to continue their stellar growth rates while AST and Wyse have already announced expected losses from battered profit margins and, for Wyse, declining revenue.

"The industry polarization is getting stronger," said Thomas Galvin, an analyst at Smith Barney, Harris Upham & Co. "As users get more and more into the OS/2 and multitasking world, reliability and quality will be stretched to the limit. People feel more comfortable with the top-tier products."

Comfort is tops

At IBM 4381 shop Pacific Standard Life Insurance Co. in Davis, Calif., OS/2 has made Jerry Waters, vice-president and director of IS, into an IBM hardware maven. He says the key selling point for standardizing on the PS/2 is not technology or price, but comfort.

"It may not be the best way, but it'a the easiest way to address our long-range strategy to migrate to OS/2 for distributed processing," he said. Waters noted that his shop is not all-IBM, with peripherals from Memorex Telex and Xerox Corp.

Waters also exemplifies another trend toward shorter short lists — the desire to simplify one aspect of an increasingly complicated job. "I don't have enough people for someone to go through magazines" looking for PC vendors, he said. "I just want one that will do the job and still be in business in five years."

Confusion about operating system software is also playing into the hands of the largest PC vendors. "Users are trying to sort out Unix, OS/2, OS/2 Extended and DOS 4.0," said industry consultant Richard Shaffer, president of New York-based Technologic Partners. "The more confusion there is in software, the more buyers try to deal with it by reducing the confusion in hardware."

Bechtel Group, Inc. in San Francisco, with some 2,500 PCs corporatewide, is currently in the process of narrowing its PC vendor list. "As you try to network all these systems together, you want to cut back on the number of variables, and one of those is the number of different suppliers," said H. William Howard, manager of information technology.

CORRECTION

Supercalc, a mainframe spreadsheet sold by Computer Associates International, Inc., was incorrectly termed "the leading mainframe spreadsheet" [CW, Dec. 5]. It is one of several products in that market.

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On VAX and mainframe connectivity: "A clear demonstration that Cullinet now offers not only a powerful database and a rich development environment for the VAX, but also an architecture that permits a simple transparent exchange of data between a mainframe and VAX."
—Charlotte Walker

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NEWS SHORTS

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Jerusalem virus strikes capital

Monday, last Friday, the 13th, brought unwelcomed reports of a virus attack on PC systems in the UK. According to published reports, the virus slowed defined files; it reportedly hit a UK-based firm with over 400 personal computers. "My gut feeling is that it is a modified version of the Israeli virus," said John McFee, president of the Computer Virus Industry Association in Santa Clara, Calif. The Israeli virus contained a timebomb designed to go off on May 13, 1988, the 40th anniversary of the last day of Palestine. "I don't know if it is a virus or individual errors," said Harold Highland, editor-in-chief of Computers & Security. Highland has isolated the Israeli virus and said it resides on the PC's boot sector and should be easily discovered with the help of tools such as The Norton Utilities from Peter Norton Computing.

MAI keeps Prime bid alive

MAI Basic Four, Inc. last week extended through Thursday its $20-per-share bid for Prime Computer, Inc. A hostile takeover attempt from the start, the MAI/Prime affair has grown vitriolic in the past days, with allegations of injustice to shareholders whining across the wire and through the mail in both directions. As of last Thursday, MAI had garnered 64.8% of Prime's outstanding stock; under relevant Delaware law, the would-be hostile acquisitor needs 85% to bring off the buy.

Ashton-Tate targets MIS

Ashton-Tate Corp. last week unveiled a consulting and training group that is aimed at helping MIS departments implement new database architectures and communications systems. The group numbers less than 100, but it will be growing throughout the year. The focus of the group will be the Ashton Tate/Microsoft/Sybase SQL Server, Dbase/VAX and Dbase-to-host communications products. According to group head Barry Ohrnad, Ashton-Tate consultants will be able to recommend and work with non-Ashton-Tate applications. Fees will be determined on an hourly or project basis.

Unisys moves up shipments

Unisys Corp. said it will get its 2200/600 mainframe series out a month ahead of schedule with the delivery of one model to New Jersey Bell in February. The company also recommitted to a March shipment date for its smaller mainframes, the 2200/400 line, which were supposed to be out by the end of 1988. The company announced in September that the 400s would be three months late.

Taken down a peg

IBM may have enjoyed a comeback year in the mid-range marketplace and on the bottom line, but it slipped in the eyes of corporate America. After six years as *Fortune magazine*'s most admired computer corporation and several more as the most admired U.S. firm, the industry giant fell behind Hewlett-Packard Co. and Apple Computer, Inc. among computer vendors. Digital Equipment Corp. dropped to fourth from second last year, while Amdahl Corp., a newcomer to the computer top 10, came in sixth. Electronic Data Systems Corp. remained the most admired diversified services firm, and Control Data Corp. stayed in the top 10 least admired companies in all industries.

Monitoring the inauguration

BY ALAN J. RYAN
and MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The committee planning Friday's inauguration of President-elect George Bush is busy with more than simply planning and keeping track of the event and its associated pageants and parades. It is also selling souvenir license plates made at prisons.

The license-plate operation springs up every four years and dates back to 1933, but this year the Presidential Inaugural Committee (PIC) is taking advantage of 36 personal computers donated by NCR Corp., according to Bill Johnson, who is in charge of logistics for the inaugural committee's marketing department.

Back in the operations center, Chuck Williams, who became responsible for the center on Nov. 16 shortly after retiring from the U.S. Air Force, has a staff of seven to ensure that the 36 official inaugural events run smoothly.

Second time around

The Bush inauguration is the second for Williams, and it can be hectic at times, he said. When the PIC moved into its headquarters in November, it was nothing more than an empty warehouse. "While these guys were putting together the hardware and software and trying to find a desk to set this equipment on, workers were building the walls around us," Williams said.

In the marketing area, most of the microcomputers — NCR's PC810 and PC916 models — are used to handle orders and monitor trends in sales of inaugural memorabilia, including license plates. Twenty PCs are linked into a Novell, Inc. local-area network, Johnson said.

In addition to using typical software packages such as Wordperfect Corp.'s Wordperfect 5.0 and Borland International's Paradox, the marketing department is using custom software from American Management Systems, Inc. (AMS), a firm based in Arlington, Va.

Prison plates

The AMS software handles order entry, processing, billing and label printing for the license-plate operation, drawing from a database in the Novell file server. Orders are sent by Panafax Corp. facsimile machines to two prisons assigned to make the commemorative license plates.

In the operations area, the three PCs are hitched to monitors so that information can be viewed and captured. The group is connected through two Novell networks with other PCs throughout the building.

One of the networks runs Directline from Must Software International, which is being used to update event information from word processing, graphics and database packages. Data from outside sources such as the National Weather Service is also fed to the server. Information is accessed through handheld remote control devices rather than keyboards, Williams said.

So far, the computer systems have run smoothly in the high-pressure environment — the staff works 14-hour days, seven days a week — and 15,000 license plates have been sold, Johnson reported.

Chuck Williams *tracks inauguration system*

Server

FROM PAGE 1

manager of applications development, moved over a database that formerly ran under Paradox, a database management system from Borland International. It took an hour to query the disk-based Paradox; the same query took one minute under SQL Server Abraham said.

If all goes well, the subsidiary will provide travel agents with a variety of SQL Server-based systems, according to developers at System One.

The biggest problem for SQL Server developers is the scant selection of tools. Several personal computer software vendors have promised to port their DBMSs, but so far none have shipped. Although SQL Server currently supports the C programming language, users will have to wait until this summer for Cobol, perhaps longer for other languages.

In addition to the Excel spreadsheet as an interface, Microsoft is working on Omega, its graphical database that uses Basic as its development language. The product is in early testing at some sites but will likely not reach the market until late this year, sources reported. Eventually, graphical front-end tools from Sybase will be ported from workstations and minicomputers to SQL Server, Kaplan noted.

Waiting for Cobol

Travelers Insurance Co. has nearly completed a thorough SQL Server evaluation and has ported a production database from another PC-based local-area network for testing, said Mike Molyn, manager of distributed processing for Travelers' database administration group. Although SQL Server provides impressive performance gains, Travelers will hold off on production implementations until Cobol support is available. Molyn said it took only two hours to move the data to SQL Server.

What could prevent widescale implementation of SQL Server at Travelers is IBM. If IBM enhances its OS/2 Data Manager into a robust and effective client/server system, "we will use that instead," Molyn said. IBM is expected to provide this enhancement by the summer.

The big advantage of an IBM offering is the eventual evolution of a distributed database system that would span IBM 3090 mainframes, Application System/400 minicomputers and Personal System/2 micros. "That will never be supplied by Microsoft," Molyn noted.

A diversified East Coast Fortune 100 firm is hard at work rewriting a tracking system to replace a similar application running under IBM's MVS. Unlike Travelers and System One, which have ported databases, this firm is building its application from scratch, using the unreleased SQL Server and Omega, the unreleased and unannounced front-end tool from Microsoft.

The firm has big plans for SQL Server and is anxiously awaiting new versions of products such as Paradox to serve as a front end to the server.

According to sources, Ralston Purina Co. is considering using SQL Server to help automate its manufacturing operations, and Covia Corp., a division of United Air Lines, is reportedly considering SQL Server to automate reservation systems.

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Muscular 68030 Mac SE to show up at Macworld

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will kick off what is expected to be a busy year for system introductions next week by coming out with a more powerful version of the Macintosh SE, its mid-range Macintosh system.

The Mac SE/30, slated for a Macworld Expo debut, will be powered by Motorola, Inc.'s 68030 chip, according to sources. It will be offered in two models — one with 2M bytes of random-access memory and a 40M-byte hard disk drive and a second with 4M bytes of RAM and an 80M-byte hard drive.

Pricing is expected to be in the $5,000 range for the 40M-byte hard drive version and in the $6,000 range for the 80M-byte hard drive model.

To the likely disappointment of Apple customers, Macworld will not see the introduction of the long-awaited Macintosh laptop, sources said. Apple Chairman and Chief Executive Officer John Sculley has promised a Mac laptop debut in 1989.

The introduction of a Mac SE fulfills other promises made by Apple last fall when it introduced the 68030-based Macintosh IIX.

At that time, Randy Battat, vice-president of product marketing, said the Mac SE and the Mac II would become the foundation of two distinct product lines.

The Mac IIX, which debuted in September, was the first new Macintosh since the original Mac II and Mac SE were unveiled in spring 1986.

Standard drive

Battat also said that Super Drive, a 1.44M-byte flexible drive that can read and write Microsoft Corp. MS-DOS and OS/2 files, would become a standard Mac peripheral. Super Drive requires 4M bytes of RAM. It will be offered with the Mac SE/30.

The Mac SE/30 retains the traditional Mac look, with the smaller screen incorporated into the base of the system. It offers a single expansion slot.

The Mac IIX sports a larger, stand-alone screen and six expansion slots like its predecessor, the Mac II.

HP plots Unix desktop ports

LAN Manager hybrid links OS/2 to Unix servers

BY PATRICIA KEEFE
CW STAFF

Hewlett-Packard Co. will detail its strategy next week for integrating Unix minicomputers and workstations into OS/2 networks, according to sources close to HP.

Using HP's Unix System V port of Microsoft Corp.'s OS/2 LAN Manager, users will be able to attach a Unix server to Microsoft OS/2- or MS-DOS-based workstations, the sources said. Those desktop users will be able to access Unix-based resources. It also provides Unix shops with more freedom to choose the workstation best suited to their needs and budgets.

In addition, sources close to HP said the mini maker plans to beef up its work group and Starlan 10 product lines.

HP representatives declined to confirm or deny the reports.

The HP LAN Manager OS/2 server software is an adaptation of LAN Manager/Xenix (LM/X), a generic Unix port that HP is co-developing with Microsoft. It is expected to ship this summer.

"HP has recognized that if you can't own the desk top, you can at least attempt to control it via these types of network products," a source close to HP said. The mini maker's approach here is to attempt to create user dependency with its network access to multiple standards; it will position its Unix LAN Manager server software under the Advancenet umbrella.

On the drawing board

HP is expected to announce the following specifics:

- LAN Manager connectivity to the HP 3000 and 9000 minicomputers, which would allow these machines to function as OS/2 servers.
- The ability to integrate MS-DOS, OS/2 Standard Edition 1.1, Transmission Control Protocol/Internet Protocol (TCP/IP) and HP-UX, which is a superset of System V.
- Support for OS/2 LAN Manager's Named Pipes and Mail Slots application programming interfaces, IBM's Netbios and LU6.2, as well as Berkeley Sockets, software utilities based on the University of California at Berkeley's Unix.
- Services will include Arpa (which gets users into Digital Equipment Corp.'s Decnet, for example) and Berkeley Services, TCP/IP's Telenet Mail and IBM's Distributed Office Support System and Professional Office System.
- Despite being a charter member of the Extended Industry Standard Architecture group, HP will unveil both an IBM Micro Channel Architecture-compatible card and an IBM Personal Computer AT bus card for its Starlan 10 line.

First announced by Microsoft last February, LM/X reportedly will enable a Unix System V-based server to service requests from workstations running under Microsoft Networks (MS-Net), MS-Net for Xenix and LAN Manager network software.

The generic LM/X port runs on Intel Corp. 80386-based servers and under Microsoft's Unix System V/386, Release 3.2 operating system.

However, it can be ported to other versions of Unix and other chips such as Motorola, Inc.'s 68000 family, a popular Unix platform, said Paul Sribhibhadh's Microsoft's director of Xenix marketing.

NAS deal

FROM PAGE 1

"If there were any change, we probably wouldn't see it for six months or more," agreed Gene Robbins, assistant vice-president of academic administrative services at Queens College in New York. "Only time will tell if our relationship with NAS will be status quo or turn negative later on." The college has a 3-year-old NAS 8023 mainframe and 16 NAS disk drives. It has used NAS machines since 1982.

The partial marriage matches hard-charging, acquisition-minded peripherals veteran Memorex Telex with an IBM plug-compatible mainframe seller whose fortunes stagnated last year.

NAS' performance was a major drag on National Semi's bottom line at times during the past year, and it was clear to users and analysts that the chip-making parent was seeking both an exit from the systems industry and needed cash.

But NAS' uneven financial performance often made it the star performer when National Semi's other operations were unprofitable. NAS' performance slipped badly during the six months ended August 1988, but the second fiscal quarter ended Nov. 30 brought record bookings for CPU and disk-drive orders.

NAS disk drive customer Michael S. Heschel, corporate vice-president of the Information Resources Division at Baxter Health Care Corp. in Deerfield, Ill., agreed that any change would come later on. "We'll see what happens over the next six to 12 months," he said. "I don't think even the two parties involved know exactly how it'll come out."

Pass the hat

Under terms of last week's agreement, National Semi will receive $250 million in cash and four million shares of Memorex Telex common stock, equal to 10% of the privately held company. The cash will not come directly from Memorex Telex but from a consortium of financial institutions raising the $250 million by pledging the assets of NAS, according to a NAS spokeswoman.

"This is just a transitional step to the merge yet to come," said Bob Djurdjevic, president of Annex Research in Phoenix. "Ultimately, Memorex Telex will probably exercise their purchase option and buy the rest."

If that happens, Memorex Telex will surpass Amdahl Corp. as the leader in total sales of IBM plug-compatible systems and peripherals, with annual revenue of about $3 billion.

"We want to have a major role in the full spectrum of products, either directly or indirectly," said George L. Bragg, executive vice-president of strategic planning at Memorex Telex. "This arrangement will allow each company within the $3 billion entity to specialize in its own product area: NAS will provide the full range of CPUs and peripheral products, while Memorex Telex will provide complementary peripherals and communications products."

There are interesting potential synergies regarding Japan's Hitachi Ltd., supplier of both NAS and Memorex Corp. products. Hitachi has supplied Memorex with solid-state drives for resale under the Memorex label. NAS sells the same solid-state drive as the NAS 7900 Semiconductor Disk.

"If [NAS is] joining forces with Memorex, the question would be whether they would begin to move away from the Hitachi product line and toward the Memorex product line," Baxter Health Care's Heschel said.

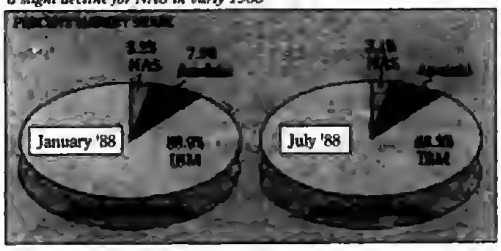
Hitachi's philosophy "has been to leave their options open and to let the product flow through multiple distribution channels," Djurdjevic said. In Europe, for example, there are three Hitachi CPU distributors — Comparex, Ing C. Olivetti & Co. and NAS Europe.

A Hitachi spokesman declined specific comment on the NAS-Memorex Telex deal.

Memorex Telex's corporate headquarters in Tulsa, Okla., is within 100 miles of an 18-month-old Norman, Okla., Hitachi factory that produces disk drives for NAS. The 73,000-square-foot Hitachi factory is doubling its capacity this year [CW, Jan. 9].

Slow going

The U.S. installed base of IBM and compatible mainframes showed a slight decline for NAS in early 1988



SOURCE: ANNEX RESEARCH AND COMPUTER INTELLIGENCE
CW CHART: DOREEN DAHLE

Greater access

Combined market share of NAS and Memorex Telex in high-end IBM-compatible direct-access storage devices would claim the No. 2 spot — still far behind IBM

SOURCE: INTERNATIONAL DATA CORP.
CW CHART: DOREEN DAHLE

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		Feb 7ar Feb 22f
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	Columbus	Jan 12f
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COMPUTERWORLD

Net management star of Comnet

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Network management will once again hog the limelight with high-speed host networks as the other major attraction at this year's Communications Network conference.

Among the Comnet show's network management high spots will be Cincom Systems, Inc.'s introduction of Expert System Foundation, development tools for automating the management of IBM Systems Network Architecture networks through Cincom's Net/Master. The offering was designed to help network managers lacking programming skills to implement their knowledge in automated network management procedures, said the firm's senior product manager, Vicky Duckworth.

A Group 40 IBM MVS-based version of the product is priced at $10,000. Cincom also announced Net/Stat, a rule-based system driven by the changing status of network devices rather than by events, Duckworth said.

Other announcements at the Feb. 5-8 show should include the following:

• AT&T is expected to roll out major components of its Unified Network Management Architecture, which reportedly will provide integrated monitoring, troubleshooting and diagnostics across a wide variety of AT&T voice and data networking equipment and services. According to one industry source, the announcement, which will take place either at Comnet or the week before, will include a link to IBM's Netview and to Cincom's Net/Master.

• Start-up company Clear Communications Corp. in Deerfield, Ill., is expected to announce Clearview, a network management system that monitors carrier lines and generates performance reports based on a variety of parameters, company spokesman Robert Copithorne said. The system, which can be interfaced with T1 equipment vendors' network management systems, arms managers with the information they need to anticipate network failures, correct carrier billing and compare competing services, Copithorne said.

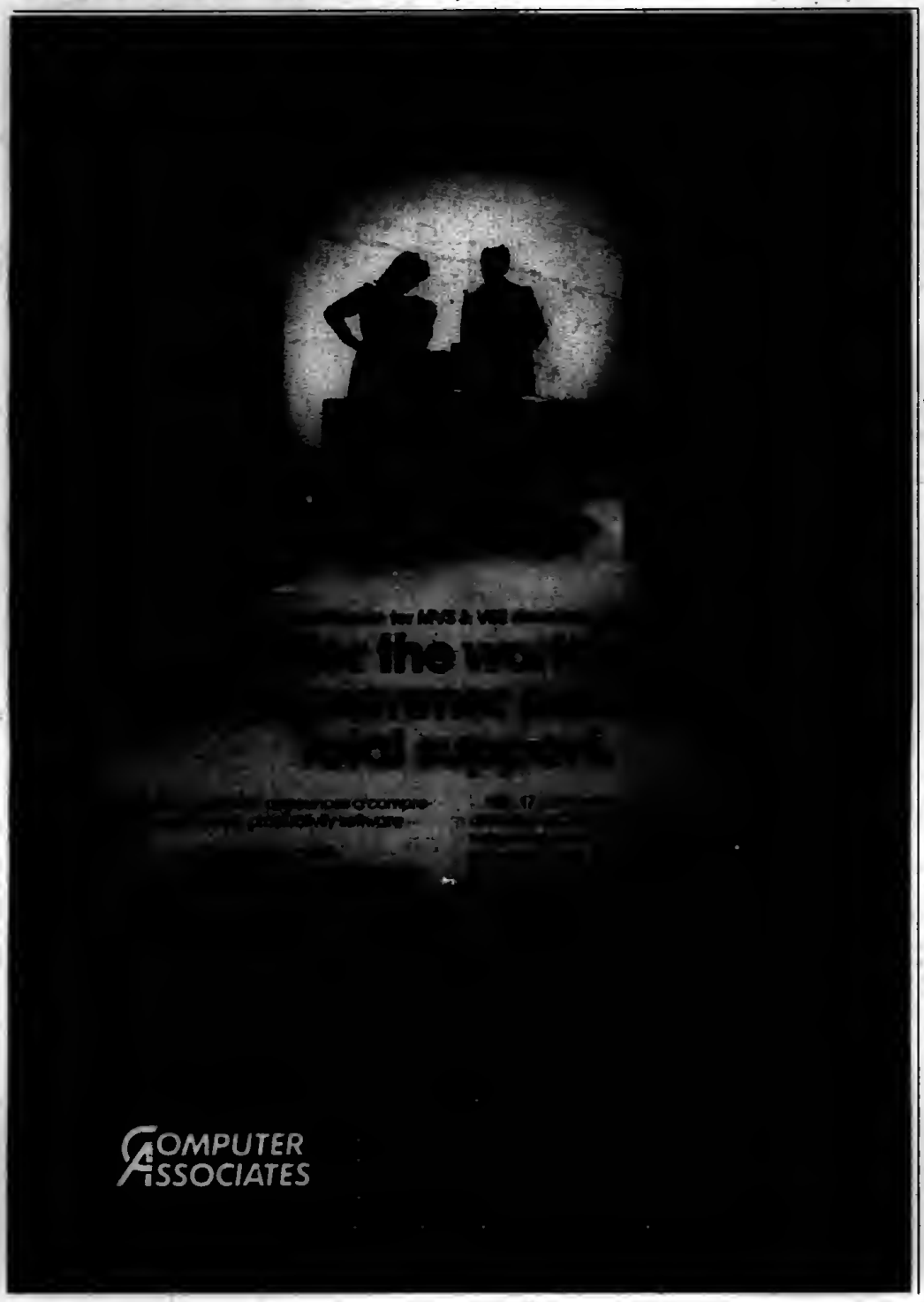
AMONG THE Comnet show's network management high spots will be Cincom Systems, Inc.'s introductions.

• Two products are expected to vie for the title of first channel-attached mainframe network based on the Fiber Distributed Data Interface (FDDI) standard.

Fibronics International, Inc. in Hyannis, Mass., will announce its FX8222 IBM-to-FDDI Controller. The product will link the channels of IBM and IBM-compatible mainframes over an FDDI local-area network, a company spokesman confirmed. In data streaming mode, the link will handle speeds of up to 24M bit/sec., the company said.

Integrated Networks Corp. in San Diego will announce Fibertalk 3000 Channel Interface Unit, an FDDI-based network that can support full host channel speeds of 4.5M byte/sec., or approximately 35M bit/sec., over distances of up to 1.2 miles, a company spokesman said. The units are said to support IBM mainframes and compatibles as well as IBM cluster controllers.

A third channel-based networking product introduction is expected from Data Switch Corp. in Shelton, Conn. The Channelnet Model 9455 Channelplexer is said to extend up to four IBM or compatible host channels over a 45M bit/sec. T3 circuit at speeds up to 3M byte/sec. The product is said to save money for users by supporting up to four links between host channels and high-speed peripherals over the same T3 link.



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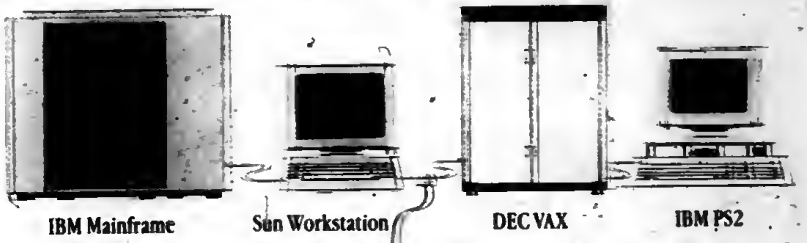

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TBBA

OSF details user interface

BY AMY CORTESE
CW STAFF

The Unix tables have turned once more. The Open Software Foundation (OSF) has apparently gained renewed credibility with its selection of a user interface, leaving AT&T supporting an interface that differs from what is likely to be the standard look and feel.

The reaction among Unix vendors and observers was generally positive last week, as the OSF explained its rationale for choosing its graphical user environment, called OSF/Motif. The OSF said it chose the Presentation Manager appearance offered by the joint Hewlett-Packard Co./Microsoft Corp. interface to facilitate the migration of personal computer users to Unix systems.

Changing their tune

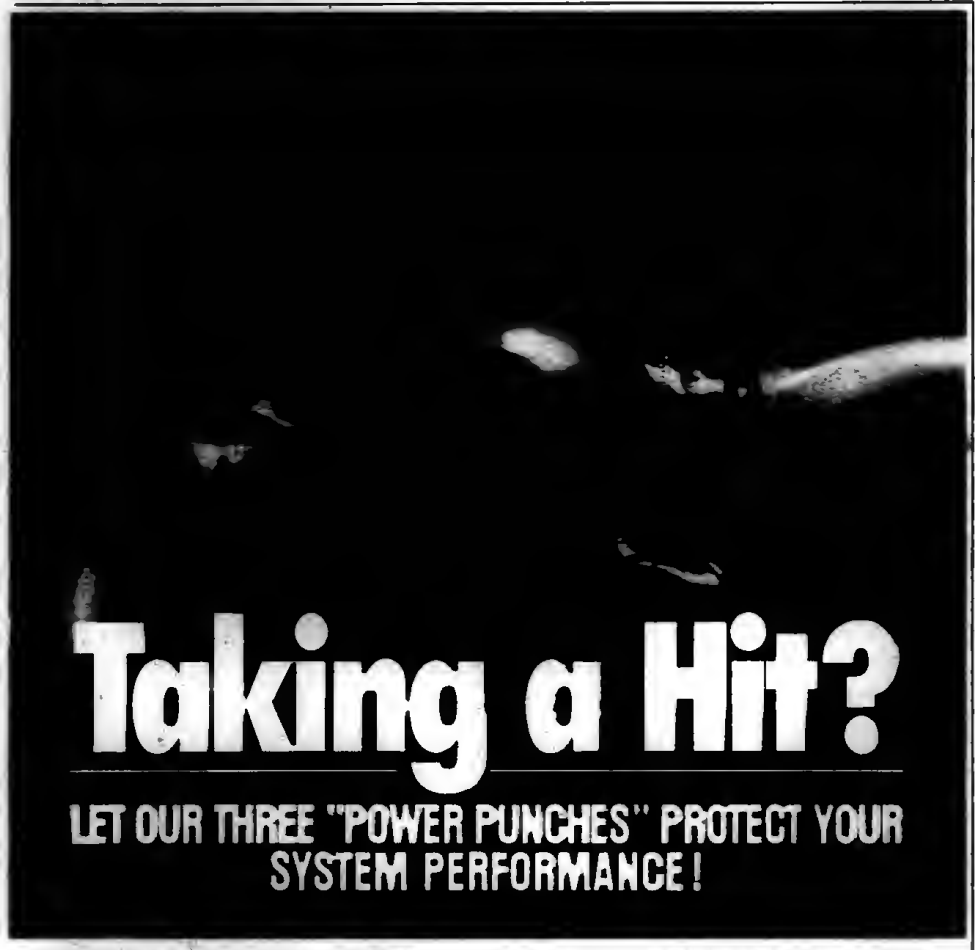
Analysts, once skeptical of the OSF, applauded the action. Amy Wohl, president of Bala Cynwyd, Pa.-based Wohl Associates, said the OSF was successful in accomplishing a technically and politically difficult task in a short amount of time. "I didn't believe they could do it, but they managed to pull it off," she said.

The OSF's decision to adopt the Presentation Manager look and feel is expected by some analysts to establish that screen behavior as the dominant one in the industry. Tom Kucharvy, president of research firm Summit Strategies, said it was a foregone conclusion that Presentation Manager will be the standard user interface look, excluding the Apple Computer, Inc. Macintosh market.

Both DEC and HP have indicated that their separate user interfaces, Decwindows and New Wave, will evolve to comply with OSF/Motif, and some observers ventured that AT&T would be forced to do the same. Indeed, an AT&T spokesman stated that Open Look may not be bundled with the next release of Unix System V, although developers' tool kits will be available sometime this quarter.

OSF/Motif reportedly will be available midyear and will be offered separately as well as bundled with OSF/1 when that becomes available. The OSF said it expects the interface to be ported to other environments such as Unix System V and proprietary operating systems.

The OSF also revealed what are considered to be generous licensing terms to make the product appealing to software developers and computer manufacturers. In addition to a $1,000 charge for a source license, computer vendors are subject to a $40 binary license per unit that Motif is used with, and software vendors likewise must pay a $10 runtime license fee for each software application Motif is bundled with. There are volume discounts applied to both the runtime and binary license fees, and the costs will must likely be passed on to the end customer by vendors.



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CIS lender woes could force sale

BY NELL MARGOLIS
CW STAFF

SYRACUSE, N.Y. — Dogged by liquidity woes, Continental Information Systems Corp. (CIS) is negotiating the sale of part or all of its business, a company official confirmed last week.

Analysts who followed the company through its climb to the No. 2 status in the computer leasing industry said that CIS' problems, which one analyst called "a tragedy," were particular to the company and not indicative of trouble in the industry at large. "Actually, the industry is doing well," said L. Crandall Hays, an analyst at Robert W. Baird & Co. in Milwaukee.

In fact, that potential is there for CIS, according to Theodore Levy, who follows the company for Rochester, N.Y.-based analyst Sage, Rutty & Co. However, neither CIS' $1.5 billion lease portfolio nor what Hays referred to as "a huge cash flow" may prove sufficient to stave off creditors that have grown skittish in the face of CIS' apparent inability to turn around problems stemming from its 1987 acquisition of arch-competitor CMI Corp.

"CMI had an admirable record — its earnings went straight up from 1984 to 1987," Levy said. "But even then, they were highly leveraged."

Costs associated with the assimilation of CMI figured largely in CIS' reporting a multimillion dollar first-quarter loss last spring. The company's stock fell, and its creditors panicked, Levy said. "If you're a leasing company and your creditors back away," he noted, "you're in bad trouble."

CIS' trouble may have come to a head last week, when the company defaulted on $3.8 million worth of interest due to The Prudential Insurance Company of America on a $110 million loan. CIS, a spokesman said, had filed for a waiver of the payment before the 10-day grace period expired last Tuesday.

The spokesman declined to give details of the negotiations except to confirm that CIS is contemplating a whole or partial sale, that the possibility of an equity investment by an unnamed investor or investor group is also under discussion and that CIS does not believe that filing for protection under Chapter 11 of the U.S. Bankruptcy Code is the route to take.

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IL	Chicago	Jan 25	Feb 28	Mar 21	
		Apr 18	Jun 14		
IN	Indianapolis	Jan 31	Mar 22	Jun 7	
KY	Louisville				Apr 4
LA	New Orleans				Jan 27
MA	Boston	Jan 17	Apr 20	Jun 6	
	Burlington				Mar 15
MD	Baltimore				Apr 12
	Columbia				Mar 15
ME	Portland				Mar 2
MI	Dearborn	Feb 7	Apr 4		
	Grand Rapids	Jan 12	Mar 8	Jun 6	
	Lansing				Feb 14
	Troy	Mar 7	Jun 7		
MN	Minneapolis	Jan 11	Mar 14	Jun 13	
MO	Kansas City	Jan 26	Jun 27		
	St. Louis	Jun 12	Mar 9	Jun 6	
NC	Raleigh				Jun 10
NE	Omaha				Apr 6
NJ	Iselin	Feb 15	Mar 30	Jun 28	
	Princeton	Jan 18	Mar 15		
	Secaucus	Jan 26	Mar 2	Apr 19	
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		Feb 22	Apr 19	Jun 14	
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	Beachwood				Apr 5
	Cincinnati	Jan 26	Mar 23		
	Columbus	Jan 12	Mar 9		
OK	Oklahoma City				Feb 8
	Tulsa				Jan 24
OR	Portland				Mar 14
PA	Philadelphia	Feb 6	Apr 10	Jun 19	
	Pittsburgh	Jan 18	Mar 15	Jun 14	
	Scranton				Feb 15
RI	Providence				Feb 2
SC	Charleston				Mar 9
	Greenville	Feb 8	Apr 13		
TN	Memphis				Apr 19
	Nashville				May 4
TX	Austin				Jan 19
	Dallas	Jan 10	Feb 1		
		Mar 7	Apr 4	May 4	Jun 7
	Houston	Jan 12	Feb 9		
		Mar 9	Apr 6	May 4	Jun 8
	San Antonio				Jan 20
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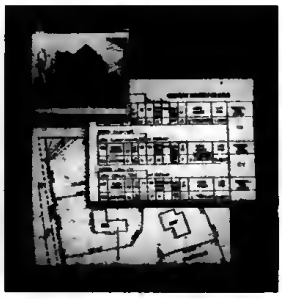
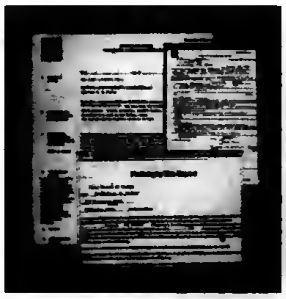


Bank appraiser mails in photos of property, plot plan and comparables.



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Court

CONTINUED FROM PAGE 1

Corporate Telecommunications Users.

Some states will jump on the tax bandwagon, Phillips said, while others may choose to become tax havens in order to lure businesses to their states, similar to the way that Brussels is considered a "data haven" in Europe.

State and city governments have enacted a variety of taxes on the fast-growing business of telecommunications equipment and services, including private lines, according to August H. Biegen, executive director of the Association of Data Communications Users in Bloomington, Minn. "That is absolutely uncalled for and runs opposite to the direction legislators ought to be going," he said.

But state governments, facing severe budget pressures, are turning to taxes on high-tech operations to boost revenue. Massachusetts Gov. Michael Dukakis, in developing a $604 million tax package announced last week, included such a provision in the wake of the Supreme Court's ruling, according to local reports.

The Supreme Court decision, in the case of *Goldberg* v. *Sweet*, amounted to an endorsement of the Illinois Telecommunications Excise Tax Act of 1985. It taxes interstate telecommunications that begin or end in the state and are charged to an Illinois address. The law provides a tax credit if the taxpayer can prove that another state has taxed the same call.

The high court unanimously rejected arguments that the state tax is an unfair burden on interstate commerce, which is protected by the U.S. Constitution's commerce clause.

Tax dancing

An Illinois trial court ruled that Illinois was unfairly trying to tax the entire cost of an interstate act, which takes place only partly in Illinois. But the lower court was overruled by the Illinois Supreme Court and on appeal at the U.S. Supreme Court last week. The high court downplayed the prospect of multiple taxation and ruled that the Illinois tax is fairly apportioned. "Its economic effect is like a sales tax, the risk of multiple taxation is low and actual multiple taxation is precluded by the credit provision," the opinion said.

The court acknowledged that interstate communications is not a local event but said it was reasonable for Illinois to tax calls originating or terminating there because it is virtually impossible to trace or separate each state's role in an interstate call.

Because of computerized switching, the court said, "the path taken by electronic signals is often indirect and typically bears no relation to state boundaries."

The plaintiffs were two Illinois residents and GTE Sprint Communications Corp., the predecessor of US Sprint Communications Co., which is required to collect the tax because it is a retail provider of communications services.

Timeplex aims to loosen up T1 net services

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Timeplex, Inc. is expected to announce tomorrow a group of products that may give users far more flexibility in how they configure T1 lines — and also give Timeplex's market share a much-needed shot in the arm.

The T1 switch vendor will announce equipment that will allow carriers to provide and users to access "fractionalized T1 services," a Timeplex spokeswoman confirmed. Fractionalized T1 refers to the ability to bundle together multiple 64K bit/sec. DS0 channels and treat them as one channel that can be routed and billed separately from the main T1 link.

This type of technology directly addresses the needs of user sites with enough data traffic to justify, for example, eight 64K bit/sec. channels but not enough to justify a full T1 link, which supports 24 such channels. It is more economical to buy a T1 circuit than to pay for individual 64K bit/sec. channels — but only if at least half of the T1 circuits are being used, said David Langholff, telecom planning manager at Mervyn's department store chain.

Mervyn's, like many companies, would like to run T1 links between its major data sites and drop and insert bundles of DS0 circuits at various smaller sites along the way as needed — except that most carriers and equipment vendors do not provide this capability, Langholff said.

Timeplex is one of several vendors that Mervyn's is considering in its search for a T1 equipment supplier, Langholff said.

The vendor's ability to offer fractionalized T1 "could give them an edge and help them recover lost market share," he said. "My guess is they've been working on this for a couple of years to leapfrog Network Equipment Technologies and Stratacom," firms that have lately been threatening Timeplex's dominance in the T1 marketplace.

"The announcement will have a significant impact on digital communications options for users this year," agreed Thomas Nolle, president of Haddonfield, N.J.-based consulting company CIMI Corp.

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The framework for accomplishing this is called Systems Application Architecture. SAA will enable customers and software vendors to build consistent software applications for different types of IBM computers—from personal computers to mainframes. SAA will make it possible for everyone in an organization to access information regardless of its location.

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Lawyers fret over risks of EDI growth

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Someday, somewhere, an electronic data interchange (EDI) transaction is going to go awry, and the hostile finger-pointing is going to land the parties in court.

The risks in EDI transactions include transmission errors, faulty data, failed communication, unauthorized disclosure to third parties, interception during transmission, late or delayed transmission and transmission to the wrong parties, according to a report by an American Bar Association's (ABA) task force.

That is why several industry groups are urging EDI business partners and vendors to consider the legal implications of EDI transactions and prepare for that inevitable day in court.

"EDI replaces paper documents — a medium that enjoys a long history of support under the law as a carrier of legal information — with a new, electronic medium, the status of which is not well defined in the law," according to a monograph written by Dallas attorney Benjamin Wright and published by TDCC:The Electronic Data Interchange Association (TDCC/EDIA) in Arlington, Va.

For example, EDI transactions may not be enforceable as contracts under the U.S. statute of frauds because they are not "written" and "signed," legal experts said. In addition, there are questions about who is liable for transmission errors.

The topic is getting increased attention from associations, standards committees and vendors because the legal uncertainties could stifle the fast-growing EDI market.

At the TDCC/EDIA's December conference here, a seminar on legal issues was so crowded it had standing-room only. "We're not trying to scare anybody," said attorney and consultant Michael S. Baum, "but EDI uses technology to form a business contract. That has a high level of legal content, so it deserves commensurate attention to the legal implications."

Baum is president of Independent Monitoring, a consulting firm in Cambridge, Mass., as well as chairman of the ABA's Electronic Messaging Services Task Force. He also serves as chairman of the ANSI X.12 Committee's newly formed Legal Issues Task Group.

Among the participants in the X.12 task group are Bank of America National Trust & Savings Association, LTV Steel Co., Mobil Oil Corp., Shell Oil Co., DuPont Co. and Electronic Data Systems Corp.

Baum suggested that MIS managers educate corporate attorneys about EDI technology, monitor legal developments and review internal procedures and trading agreements with an interdisciplinary team of technical, managerial and legal experts.

The prospect of EDI-related lawsuits will increase as the EDI trading universe grows to include less-sophisticated users and companies that may have financial problems, Baum said at the TDCC/EDIA conference.

A classic case

J. T. Westermeier, a partner at the Washington, D.C., law firm Abrams, Westermeier & Goldberg, said EDI is a classic case of technology advancing faster than the law or courts can keep up. So far, there is no case law providing guidelines for how to structure legally enforceable EDI transactions.

To compensate for the fact that EDI transactions are paperless, some EDI users have negotiated written "trading-partner agreements" to preauthorize the EDI transaction and set terms and conditions.

The ABA task force is starting the difficult task of developing a model trading-partner agreement that provides a minimum level of protection and fairness, Baum said, adding that it could be tailored to meet the needs of specific industries.

An important part of the trading-partner agreement is to spell out who is liable when something goes wrong. But apportioning liability — among the trading partners, value-added networks and software vendors — gets more difficult as the transactions get more complex and the number of third parties increases, the ABA's report said.

Under the provisions of negligence law, errors in business transactions must be fixed quickly after they are discovered or the liability goes up dramatically, Westermeier pointed out. Consequently, it may not be wise to leave EDI systems running unattended, he said.

Wright, Baum and Westermeier cited other legal issues that create uncertainty in the EDI marketplace. One is that EDI transactions may not be compatible with certain government regulations such as those that require paper forms and written signatures. The ANSI X.12 Government Project Team is working on this problem.

Another is that EDI could raise antitrust concerns if an industry's EDI standards or the cost of EDI systems creates an unreasonable barrier for small companies trying to break into an industry.

What's more, all software written to SAA specifications will provide similar screen layouts, menus and terminology. This will make it easier for someone trained to use one type of IBM computer to learn to use others. These are only some of the benefits of SAA—benefits that make it easier for you to "talk" to computers and for computers to "talk" to each other.

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Taking the hard road to database nirvana

IBM WATCH

GEORGE SCHUSSEL

Despite IBM's prodigious resources, it will be harder for the company to provide distributed database capabilities across its systems than for any other vendor.

IBM is committed to a distributed database development program that conforms to Systems Application Architecture and SQL and involves four different products. Almost all of IBM's competitors will be taking a single database management system product and distributing it over diverse operating systems — IBM's and others such as Unix and Digital Equipment Corp.'s VMS.

IBM understands well that in the 1990s, mainframes will become repositories and network servers for a large variety of midsize and small machines, at which most of the processing will occur. Cooperative processing and distributed databases will be the technologies that allow this new scheme to succeed.

IBM's plan for providing distributed database capability is based on a multiphased approach. There are three steps yet to be accomplished. They involve a remote unit of work, a distributed unit of work and a distributed request.

Stepping-stones

In step one, an application may send discrete units of work to different remote databases. However, each unit must go to only one physically remote database. This requirement is loosened somewhat in step two, at which each committable unit of work may consist of a number of discrete SQL statements, and each one of those SQL statements is then required to go to a single physical site.

In the third step, the restraints of physical location are removed and individual SQL statements may support physical execution on data that is located at diverse sites.

In terms of currently accepted definitions in the industry, it is only this final phase that can be considered a true distributed database environment. IBM's plans call for delivery of phase three capabilities in 1992 or 1993.

An essential ingredient in this plan is determining which IBM database systems will play. Four principal development laboratories are currently participating, including Toronto (SQL/DS), Santa Teresa (DB2), Rochester (Application System/400 SQL) and Austin (OS/2 Extended Edition).

Currently announced future product plans from the IBM laboratories only support "like-like" environments. What this distinction means, for example, is that the DB2 remote unit of work (step one) capability that is to be delivered in late 1989 will only work with diverse DB2 partners. SQL/DS and OS/2 Extended cannot play — yet.

At some point, distributed capabilities will be supported over unlike partners, but this feature adds a significant level of complexity, especially because of IBM's strategy designating different relational database engines.

Although IBM developers share research and product development plans among different groups, they do not share source code for the DBMS engines. The result of this policy is that even for the two different SQL DBMS engines that run on IBM 370 systems (SQL/DS and DB2), there are significant differences — different return error codes and different handling of nulls.

Santa Teresa staffers argue that differences among the SAA operating systems mean each must have its own physical implementation of SQL to operate efficiently. This is true for implemention-specific functions, such as cross-memory services and memory management.

However, since the essence of distributed database services is distributed query management, IBM's task would appear to be much simpler if it could interface the same DBMS on different operating systems.

Another reason for the separate product/separate operating system policy is IBM's management and accounting policies. IBM products have to stand on their own for profitability analyses. If two groups are building DBMS for two different environments, and one sends its query management source code to the other, then there must a cross-subsidy agreement between the two. IBM doesn't seem to want to tackle this problem.

The ultimate success of IBM's distributed database strategy is tough to forecast. A number of mainframe competitors, such as Computer Associates, Oracle and Relational Technology, appear to be ready to offer distributed database capabilities to their customers years before IBM's products are delivered. The real issue here is going to be how technically successful these distributed DBMS products will be when they live in and support the MVS environment.

Schussel, president of Digital Consulting, Inc. in Andover, Mass., is a lecturer and futurist. He chairs The Database Cooperative Processing Symposium, Software Futures, 4th and 5th Generation Data Management Software and Unix Futures conferences.

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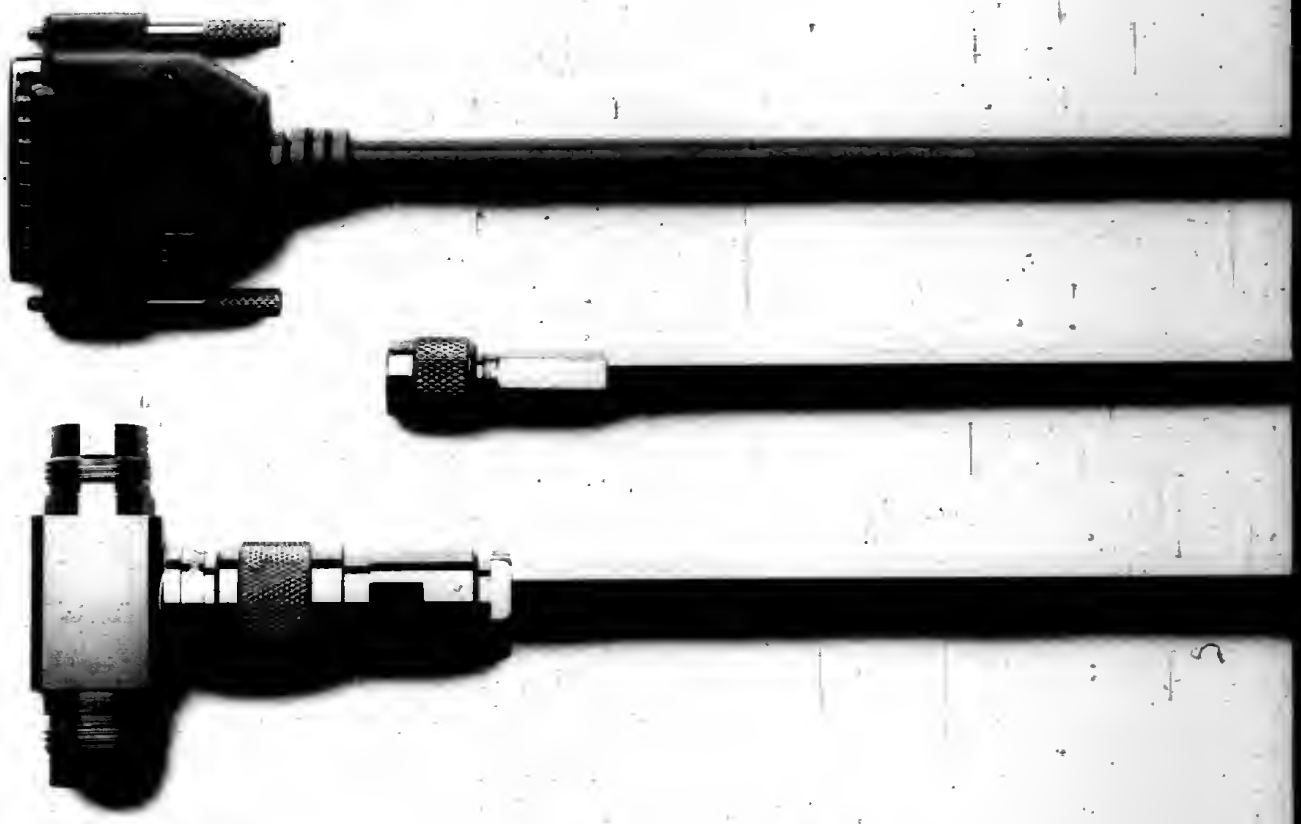

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EDITORIAL

The new limit

TWO YEARS AGO, a leading market research company predicted that desktop computers would operate at $1,000 per 1 MIPS by 1991.

Now, we all remember other predictions for the videotex market, the home computer market, etc. And often it seems to be the rule that long-range predictions are grossly optimistic.

But last week DEC apparently broke that performance/price barrier with the introduction of its reduced instruction set computing-based Decstation 3100, which headlined what the company termed its most significant set of product announcements ever. DEC's aggressive workstation thrust will touch off the most ardent competition within the computer industry since the PC clone makers began battling a few years ago. This seems to be one struggle in which the customer base will almost assuredly emerge a winner.

For one thing, prices are going to fall — perhaps hard — across the workstation spectrum. As margins tumble, vendors tend to become almost solicitous toward their customers, like car dealers during the turn of the model year.

Further, increased demand stimulated by cheaper hardware invariably coaxes that much more software development from the third-party vendors — in this case, the Unix developers.

No wonder the research companies are calling for 70%-plus growth in workstation sales this year. That's one prediction users can bank on.

Name-dropping

What do the following people have in common: John Akers, Les Alberthal, Robert Allen, Jack Berdy, W. Michael Blumenthal, Gordon Campbell, John Cullinane, Jack Davis, Charles Exley, William Foster, John Frank, Bill Gates, James Goodnight, John Imlay, Jerry Junkins, R. James Macaleer, David Martin, Jim Manzi, Scott McNealy, Gary Morgenthaler, Tom Nies, Ken Olsen, William Patton, Ken Pontikes, Ryal Poppa, Michael Potter, Robert Potter, Robert Price, John Roach, Ben Rosen, Lawrence Schoenberg, George Shaheen, Roger Sippl, Jim Treybig, Thomas Vanderslice, An Wang, Charles Wang, Phillip White and John Young?

Besides being a *Who's Who* of the computer industry, these corporate leaders make up the Chairman's Committee, which will submit nominations for *Computerworld's* Awards for Innovative Application of Information Technology.

Hatched in association with the Smithsonian Institution, *Computerworld's* awards will be presented in June to members of the information systems community who have achieved oustanding progress for society through visionary applications of information technology.

We wish to express gratitude to these individuals, who give their time and energy to seeking out the many quiet heroes of the IS world.

NEWS ITEM: REPLACEMENT COMPUTER SYSTEM AT NORAD TERMED UNSTABLE AND PRONE TO FAILURE

LETTERS TO THE EDITOR

DB2 battle is over

Frank Sweet's article on the future of databases [CW, Nov. 28] is mostly superficial or simply wrong. He sees a battle still raging between DB2 and old DBMSs such as IDBMS and Adabas that has long been over. He calls Oracle and Ingres "small newcomers."

He criticizes the SQL database language for not being a development language, but that, for various reasons, was the precise intention. He claims that SQL has "so many different ways of accomplishing the same thing that it is hard for one person to understand another's program." Really? SQL statements per se are *not* programs — that's the whole point.

He may be right that SQL "is unlikely to be popular among programmers," but only if they continue to ignore the relational approach behind SQL, seeing the language just as a portability and connectivity standard for traditional applications. Indiscriminate application of procedural thinking and unwillingness to distinguish between the physical and logical levels does indeed defeat major practical objectives in SQL, any hope for fixing its deficiencies and, thus, acceptance. It is terribly misleading to claim that "relational once meant lacking explicit interrecord relationships" and it is absolutely untrue that "today it means enabling them to exist."

Fabian Pascal
Washington, D.C.

Kissing IS goodbye

I read with interest Michael Alexander's article entitled "Don't kiss IS guy goodbye" [CW, Nov. 28]. I feel, however, that it would have been much more realistic if the title had been "Don't kiss IS guy goodbye yet."

No one can dispute the fact that for the last 10 years or so a rather significant force has transformed traditional centralized computing into distributed computing. This trend, which led to the advent of personal computers, workstations and LANs, was really the result of general dissatisfaction among users for the services they were getting over the years from the "high priests" of MIS and the data center.

I agree that there will be a need to protect these enthusiastic users from hurting themselves; a sort of internal technology advisory group may be necessary to coach them. But, that's all that will eventually remain from the bloated hoards of MIS and data center operations staff of the past. Centralized computing in the form of powerful supercomputers will soon have a place only in certain CPU-intensive environments like R&D.

Gus A. Galatianos
President
Advanced Computer Consulting International
Whitestone, N.Y.

Ashton-Tate loyalty

In your article "Ashton-Tate sues Fox over copyright" [CW, Nov. 28], you stated, "Equally ironic is Ashton-Tate's own product strategy, which has borrowed liberally from the work of others. Multimate, the word processing program Ashton-Tate acquired in 1986, was clearly patterned after a Wang Laboratories, Inc. word processor."

Ashton-Tate did not borrow anything from the Wang word processor. The Multimate product does look as if it were built based on Wang's powerful word processor, but Ashton-Tate didn't do the construction. A company aptly named Multimate International designed the program.

Ashton-Tate bought the Multimate International company in 1986, long after the product was in the public's hands.

I am not a computer user who gives my sole loyalty to any piece of software easily. However, Ashton-Tate has become a very good supplier of PC software, and I think it deserves the benefit of the doubt in this case.

Bill Komanetsky
IBM
Tampa, Fla.

No VSE aftertaste

Regarding the article "VSE users upbeat" [CW, Dec. 5] — what bitter aftertaste? The only aftertaste that might be bitter is from the lack of press coverage on VSE and related products. As IBM's most widely used operating system, VSE deserves a lot more coverage.

The features that you claim users have "long coveted" have been coming forth in a steady stream for the past four years. There are still many more features that VSE users want, like additional address spaces, ACF/VTAM in a private address

Continued on page 24

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

A (data) space odyssey

CHARLES P. LECHT

At a time when microcosmic space consumes the attention of most computer scientists, it is interesting to imagine the macrocosmic space above our Earth as a computer data storage medium.

Suddenly, we are relieved of dealing with the mysterious unseeable inner space of a centimeter-square sliver of silicon on which a hundred miles or more of microthin circuitry has been inscribed.

Instead, we soar into outer space to consider a world we can see, one we've been watching since time immemorial.

In the silicon world this year, 1M-bit chips have been joined by 4M-bit chips. 16M-bit chips are no longer uncommon, and 64M-bit chips have made their appearance. A 64M-bit chip can contain more than 3,000 pages of text at 300 word/page and 8 char./word.

Scientists are digging faster and deeper into their microcosmic world to create chips of ever larger capacity and ever smaller size.

But this world is not endlessly small. Not too far away lies the final realm they can ever hope to reach, where distances are measured in fermis — one trillionth of a meter.

At this size, the instruments they must use, like the physics they must employ, are too crude to handle anything smaller.

Scientists will have reached the practical limits of their microcosmic universe by the end of this century unless an unforeseen opening to another universe presents itself in their doing so. However, I wouldn't count on this.

Scientists who are exploring the realm of disk-based storage media are not only bound by the same problems facing the chip folks, but they must deal with electromechanical contraptions in the devices that present much fiercer limitations.

Spinning wheel

That we must use spinning disks — forget about tapes — to capture and retrieve data reveals just how archaic today's computer systems are. Until relieved of their moving parts, computers will always fail because of reasons far more basic than the advanced physical chemistry suggests.

Even the availability of multigigabyte disks or the possibility of a terabyte of information on a disk won't change this situation. The need to create, operate and maintain these disks on a whirring platform is severely limiting to their usefulness and reliability.

However much we expect to store on any single Earth-bound chip, it is clear to me that this capacity isn't enough, and we would do well to look elsewhere for future computer memory technologies.

Where? The place I have in mind employs a telescope instead of a microscope to unravel its mysteries. It is the space around this globe.

As I see it, what might practically be contained on a chip today or in the future is but a mere fraction of what might one day be contained on a single channel in wideband radio and/or in the light-wave frequencies we send into space.

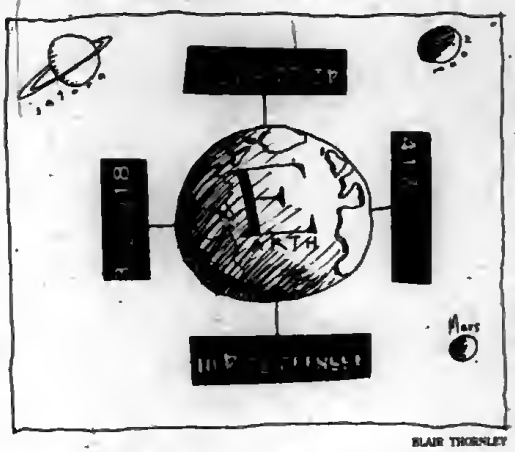
The data storage possibilities available in the medium we usually refer to simply as "space" boggles the mind.

For example, between a very high satellite and Earth, we could place just about all the data we have ever created or will create in the future.

Broadcast as radio waves or laser beamed as light waves, data could be placed in continuous loops that bound and rebound between reflective facilities on both the Earth and the satellite, to be cycled forever — however long that is — and to be drawn upon when needed.

Since the number of such loops could virtually be unlimited, so could the amount of data these could contain.

And if the satellite was capable of also storing data, it could hold some in a supercooled memory bank employing scores of chips at virtually on refrigeration (space is cold) or electrical (because of solar power) cost.



BLAIR THORNLEY

All the data we want or need could reside in an electronic veil of continually moving radio waves and photons fed from databases on the Earth and on the satellite.

Our capture and use of such data would involve no more time than we would experience here on Earth in dealing with a very large hierarchically organized database: in fact, probably far less.

Let's face it: The thousands of disk data files being used by organizations such as governmental census bureaus in heavily populated countries are inaccessible, or access time can run into days, weeks or even months.

But we are not limited to people-made satellites for reflective media. There are the natural heavenly bodies, too.

Of course, depending on how far away the reflecting body is in space, retrieval may not be as fast as we'd like.

A trip by data to our planetary bodies or even farther before its return to Earth could be measured in minutes, hours, days and years.

But the volumes that could be stored grow proportionately to the distance to their target reflector, so there is a payoff in using these, too. Talk about archival storage.

Spacing it out

Of course, the implementation of space data loops in today's technological environment is not possible. The means to broadcast, maintain and use the databases these might contain are unavailable to us.

And broad bandwidth communications facilities with proper signal-to-noise ratios that are unaffected by phenomena such as a raging storm on the sun are unavailable, too. Laser technology, which is most promising in its capability to be unaffected by natural phenomena, is in its infancy.

But we can dream of the day that the necessary technologies exist and speculate on what effect they may have on our world of computer science — if not just our world.

Lecht is an IDG News Service correspondent based in Tokyo.

Standards still missing in information world

AMY D. WOHL

As we begin this year, PC power is an ordinary fact of business life. The question isn't whether the average worker will get one, but when and which one.

Yet the real value of a PC probably isn't the information that the worker can personally generate, but rather its ability to connect him to a world filled with information other people create. We all want and need to be a part of a seamless environment — a place where all the information we could possibly want is somehow effortlessly available.

Is this desire a fantasy? Perhaps for now it is.

Today, there is plenty of information available. In fact, there sometimes seems to be far too much. Two days away from the office and I return to three inches of paper mail, piles of telephone messages and screens full of electronic mail.

I might argue that what I need is less information — not more. Our problem is that we want both: We want all of the information to be available, but we want it to be available in a form that permits it to be filtered, analyzed and manipulated without our needing to be intimately and personally involved in each tedious step in the process.

We can do some of that right now, but the many forms and formats the information can come in makes the amalgamation process not only tedious but potentially very difficult.

The underlying information for a single business document could come from a dozen different sources, each stored on a different machine, each with its own operating system, applications programs and so on.

The missing link

We are ready to use information from anywhere in our information universe, but the information universe isn't quite ready for us.

What is missing? Standards. We need to be certain that everything we have ever created on a computer, and anything we can force-fit into it through such miracles as image scanning, optical character recognition and voice recognition, can be readily understood for later retrieval and rearrangement.

We will never all use exactly the same machine running exactly the same software — if history is a good predictor — but we can demand that our computer systems behave as if this were the fact.

Standards — rules that permit information to be readily understood across multiple hardware platforms, operating systems and application environments — could accomplish this desirable goal.

Several already

We already have any number of de facto standards. Most of them are built around the widespread acceptance of a dominant software product, such as Lotus' 1-2-3 or Ashton-Tate's Dbase.

IBM's Document Content Architecture (DCA) word processing format is an important de facto document interchange standard. Nearly every word processing and word processing-related product — for example, desktop publishing — knows how to export DCA-formatted documents and how to accept them as imports.

In fact, minor word processing software often performs the interchange function via its compatibility with DCA.

But suddenly, DCA is no longer enough. Documents once restricted to characters and numbers, formatted in typing-like styles, have been superseded in many offices by compound documents.

Such sophisticated "New Age" documents may include multiple fonts and type sizes, embedded graphics and formats, such as those found in newspapers, magazines or other printed material.

They might also include excerpts from spreadsheets and databases, voice annotations or references to animated materials from a laser disk or compact disk with read-only memory. Digital Equipment Corp. is prepared to set the standard for this new kind of document and has recently published its own compound document architecture.

So far, we haven't heard vendors jump onto DEC's standard bandwagon.

But sometimes a de facto standard emerges slowly, taking

Continued on page 24

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

Wohl

CONTINUED FROM PAGE 23

months or years to gain acceptance, such as Ethernet.

Note that this evolutionary creation of a standard stands in sharp contrast with some earlier attempts. When IBM announced Distributed Office Support System (Disoss) in the early 1980s, word processing vendors were so sure IBM could set a de facto standard that dozens immediately announced their compatibility intentions. Disoss set a de facto standard without ever garnering any appreciable market share.

Perhaps this lesson — which required vendors to deliver on an expensive commitment with little commercial value — makes today's developers reluctant to identify potential de facto standards without waiting to see marketplace reaction develop.

Even though word processing standards are now set in the PC software industry, IBM is still an important factor in this market. IBM's Displaywrite continues to enjoy substantial market share, and many expect IBM to have much more to say on the subject of compound document architectures (CDA). DEC has been an important player in the office automation market with All-In-1 but has never been a high-profile rulemaker in the word processing game.

CDAs are, of course, about much more than processing words. They are really about using documents as containers and vehicles for holding and transporting information.

Such documents will surely include words, but they will also include graphics, pointers to databases and other application programs, sophisticated formats and dozens of new information objects (voice? animation?) that are still immature and relatively undefined.

Hindsight is 20/20

The vendor or group of vendors that sets the standard for compound document architectures for the next round will have important advantages:

- Buyers will perceive that vendor as the market leader or standards bearer.
- Its products will attract more third-party incremental software — making it much more valuable — than that of other, nonstandard vendors.
- It will be in a better position to manipulate the standard to best show off and support its own product offerings. That prize is worthy of much effort, and winning the compound document standards battle is likely to attract a number of worthy opponents.

But if from the battle a standard emerges, the real winners are the users; their desktop PCs become infinitely more useful as more and more information can be easily, readily and transparently accessed and combined.

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Letters

CONTINUED FROM PAGE 22

space and support for more than 16M bytes of real storage. Once given the resources and priorities like all DP shops have, you can probably rest assured that these items will come to fruition.

Perhaps when trade journals stop viewing VSE as "ambiguous," they will finally realize that IBM's development efforts toward VSE are not being rekindled; they've been blazing all along.

Jeffrey E. Smith
Technical Support Manager
Saint Luke's Hospital
New Bedford, Mass.

Mediocrity, my foot

I take strong exception to Frank Sweet's statements in "Database directions" [CW, Nov. 28] that "SQL's syntax is mediocre at best" and in his suggesting that "it has so many different ways of accomplishing the same thing . . ." is a negative attribute.

I have found SQL syntax exceptionally easy to learn and teach. SQL is a clear departure from anything capable of being labeled "traditional." Rather than being a programming language, SQL extends the capabilities of other languages by providing a set of database access statements that blend into most languages smoothly.

It is easy to describe SQL as "fat and complex" without genuine comparisons with other approaches. Having had several opportunities to solve test problems with both SQL and several of the so-called fourth-generation languages, I have found that SQL and a good structured language such as PL/I or IBM's Rexx performed rings around the slow and inflexible fourth-generation languages.

Douglas E. Person
Senior Technical Specialist
Broadway & Seymour
Charlotte, S.C.

Send 'em to school

Regarding Michael Cohn's article "What to do with leftover PCs" [CW, Nov. 14], I have an excellent idea what would be beneficial both to the corporations involved and the recipients.

Give them to schools! I am a high school mathematics and science teacher and an avid computer enthusiast. My classroom has three Commodore 64 computers that I managed to get out of my budget four years ago. I would love to have several personal computers and junk the old 64s I share with the math teacher next door to me.

Continued on page 25

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Letters

FROM PAGE 24

The math/science budget at our school will allow us to repair older PCs or even update them somewhat; we can even buy newer software that's available — Computervision's Computer-Aided Design and Drafting System, oscilloscope emulators, etc. — but I cannot afford to purchase a PC or compatible. The new LCD panels that sit on top of an overhead projector and plug into your PC will allow me and other math/science teachers to present graphs and prepare computer graphics to the whole class at once.

It is really hard to teach tomorrow's scientists, engineers and mathematicians with a chalkboard. These kids need to see and experiment with modern equipment and information. They need to be able to enter, manipulate, edit and sort data.

So if any corporations out there would like a good tax write-off, send your old PCs; you might even like to find a home for that old, slow nine-pin printer or plotter.

Rod Roberts
Mathematics Chairman
Grandview High School
Grandview, Wash.

Not so fast . . .

Regarding your article saying that image transmission times have been reduced from 10 seconds to two [CW, Nov. 14]: It takes the improved Photophone two seconds to retrieve an image from a diskette and display it on the screen, not to transmit the image. Transmission time ranges from about 12 to 25 seconds, depending on the resolution mode selected and the content of the image itself.

Larry Buerk
Director, Corporate Communications
Image Data Corp.
San Antonio

Both sides now

Janet Ruhl's article "Now you see it . . ." [CW, Nov. 21] struck a chord I feel quite strongly about: honesty in hiring. It is worth mentioning that there are those of us on the hiring side who believe that full and fair discussion of both the job and the applicant's qualifications is right, both ethically and in terms of the long-term benefits derived by the company and the employee.

In my department at Wang, managers and peers interview candidates. This gives us a broader view of the candidate, allowing us to make a more considered decision. Just as important, it gives the candidate the opportunity to really see the environment in which he or she may soon be working.

In an interview, I always turn it around and invite the candidate to interview me about the job, the group or Wang in general, and I answer as accurately as I can. I believe that honesty on our part encourages honesty in our candidates. Then if both sides decide to go ahead, we get an employee who is more likely to enjoy the job, be productive and stay with us. And the employee is more likely to land a job that solidly meets his or her career objectives.

Charley B. Cross
Manager, Investment Systems Development
Wang Laboratories, Inc.
Lowell, Mass.

All this and more

Regarding Bill Gates' statement on OS/2 memory requirements [CW, Nov. 21] that "true multitasking won't work in a 1M-byte system," perhaps Mr. Gates has forgotten Microsoft Corp.'s product, Amiga Basic, which ships with every Commodore Amiga. The base Amiga configuration includes 512K bytes of random-access memory and 256K bytes of read-only memory. Amiga Basic multitasks quite nicely in this amount of memory. In fact, running two or three moderate-size programs plus a spare command line window is possible on a 512K-byte machine.

Neil W. Plouff
Bolton, Mass.

Leading the pack

I read the article titled "Cray lays out product plans for next decade" [CW, Nov. 21] with interest. Cray Research is again on the forefront of technology. The article indicates that it is even redefining the classical measurement of memory capacity; memory will now be sized in millions of floating-point operations per second rather than in bytes or words.

Dennis C. Wright
Houston

Finding a balance

I agree with Michael Alexander's article "Downsizing threatens MIS influence" [CW, Nov. 28], in which he states that the issue may lie in finding a balance between distributing technology throughout the organization on the one hand and keeping the data center on the other.

A changing role of MIS is to build the architecture through which the dispersed systems will function. MIS will also be responsible for managing the connectivity of the organization's networks along with setting guidelines and creating a methodology for using and controlling the network.

While connectivity is important, connectivity alone will not do. At early stages of the organization's networks, it is critical to develop and document accepted guidelines for using the network. In such guidelines, it is imperative to document who performs what functions and when.

Security issues should also be considered before security violations occur. It should be clearly stated which department is responsible for developing which part of the methodology for using the network. Maintenance issues should be resolved. The second important step is to enforce the methodology throughout the organization.

Dan Kamoji
Standards Analyst
Merchants Service Corporation
Indianapolis

A real country

I thoroughly enjoyed your editorial "Glass not" [CW, Nov. 28]. Since I am of Ukrainian descent, however, I feel it is important for your editorial staff to recognize that the use of the word "the" before Ukraine is inappropriate.

The use of this form suggests that Ukraine is a region when it is, in fact, a country of 60 million people. Respectfully, I, along with millions of Ukrainians in the free world and those under Russian oppression, lose a micro grain of precious dignity left to us as a people each time our country is referred to as a farm plot in the Soviet Union.

Gregory Hawryschuk
Rochester, N. Y.

Source of power

Thank you for publishing David Gabel's piece "Protecting computer power" [CW, Nov. 28]. However, I think it is important to bring up one point that the article missed.

Not all power-related problems will be obvious. Although blackouts and brownouts are sure signals that something is wrong with your power source — whether internal or because of power company supply — there are many other not-so-noticeable power-related problems. Random missing data, periodic unnoticeable crashes and other arbitrary glitches often are caused by faulty power.

Readers should monitor their power source as a matter of course rather than waiting to pinpoint that it is indeed the cause of their problems.

Alison Harris
Managing Editor
Service News
Yarmouth, Maine

Another brick

I enjoyed reading your recent Viewpoint article by Efrem Mallach about reduced instruction set computing (RISC) technology [CW, Nov. 28]. I found him to be right on the mark in regards to the "RISC marketplace" being a fictional entity created by marketing enthusiasts. However, Mr. Mallach unfortunately continued to propagate a basic misunderstanding about the actual nature of RISC design.

RISC is actually just another step in the evolution in chip design, once again made possible by continuing advances in miniaturization. Chip miniaturization has now reached the point where there is enough room on a single chip to once again build computers entirely from discrete logic.

These computers are as full-featured as their microcoded ancestors. But they have a strong advantage because they run the CPU instructions directly, giving them an order-of-magnitude increase in speed over microcoded machines that must first interpret their instructions.

Eventually, the day will come when there will be so much space available on chips that we may see operating systems in microcode, on chip main memory or perhaps even entire systems that include device controllers on the chip.

David Spencer
Sacramento, Calif.

A true linkage?

Regarding "IBM pushes SAA-Unix links" [CW, Nov. 28], the wide range of overlapping options makes the choice of application and communication architectures all the more difficult.

"Traditional" Unix components such as Network File System and X Window System have been announced for MVS, VM and CICS. Also, LU6.2 and other Systems Application Architecture (SAA) components have been announced for IBM's AIX. Before deciding on an intersystem connectivity architecture, the following pair of questions needs to be answered:

- Which system is best for each application component?
- Which system will be best in the future for each application component?

In the "AIX Family Definition" announcement, the following is found in the summary: "The AIX Family Definition is IBM's long-term strategy for providing, across multiple IBM environments, a consistent set of interfaces, conventions and protocols." Following up on this strong statement in the "IBM AIX/370" marketing brochure is a section entitled "Systems Application Architecture Relationship."

This reads: "Where conflict exists between AIX and SAA, IBM will give priority to maintaining consistency in the Unix environment."

Perhaps the ultimate role of SAA-Unix connectivity will be to foster migration of applications from SAA to Unix as even IBM enters the age of the open system and leaves the closed system behind.

Ron Wolf
Foothill Research, Inc.
Belmont, Calif.

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SOFT TALK

Stanley Gibson

Let's have consistency

And lo, there was upon the Earth a great noise. And the noise was good. Well, almost.

The noise came from DEC in its desktop announcement last week — one of its largest ever in terms of people present and number of products introduced. The announcement is critical for DEC, which needs a big bang to succeed on the desk top. The company hopes to strike a lightning blow against archrivals Sun Microsystems and IBM and to assert its equality, if not outright dominance. Its strategy of connecting multiple operating systems and desktop devices, while not elegant, may substantially succeed.

The linchpin in the connectivity scheme is Decwindows, DEC's X Windows System-based user interface and interoperability scheme. But there were two aspects of the announcement that raised questions about the omnipotence of Decwindows and DEC's skill in getting across a consistent message.

First, where was Apple? One year ago, Ken Olsen was praising John Sculley and Apple as kin-

Continued on page 32

Users say yes to IBM 3990

Performance a big boost, despite shipping and advanced feature delays

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

Users of the IBM high-end storage controller that shipped at the end of 1988 are already reporting big performance boosts for their mainframe operations.

As a result, they say they do not care that IBM failed to meet its original delivery schedule and delayed the more advanced features for the product until sometime later this year.

"Obviously, when the additional features come out, we'll pick up more performance," said George Kulman, first vice-president of MIS at Integrated Resources, Inc. in Elmwood Park, N.J. "Actually, it ended up being an easy phase-in of the system."

The controller, the IBM 3990 Model 3 with cache capability, was originally scheduled for delivery in the third quarter of 1988. It was to be a major leap in technology from both IBM's earlier 3880 controller and the initial models in the 3990 line. The newest 3990 promised not only to boost basic controller features such as channel speeds but also to add new features such as DASD Fast Write and Dual Copy.

In mid-1988, IBM announced that it would not in fact ship in the third quarter and targeted first-quarter 1989 as a new shipment date. In late September, IBM again changed the schedule and said it would deliver the Model 3 with cache capability by year's end. But the DASD Fast Write and Dual Copy, also known as the Extended Features, would still be delayed until sometime in 1989.

Despite these delays, users contacted by *Computerworld* last week said they are impressed with the product because even the base Model 3 without the cache boosted their performance.

The cache capability, delivered in December, and the Extended Features, expected this year, are viewed as bonuses,

Continued on page 32

Honeywell Bull farms out Multics

BY STANLEY GIBSON
CW STAFF

Three years after it gave Multics users the grim news that the Multics operating system and hardware would not be enhanced, Honeywell Bull, Inc. said recently that it is turning over service and support of its Multics operating system to ACTC Technologies, Inc. in Calgary, Alberta, Canada.

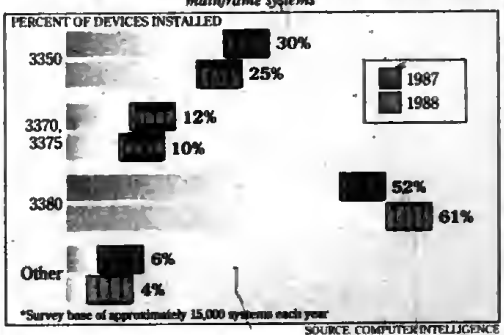
ACTC will support Multics worldwide and assist Multics users in migrating to Honeywell

Continued on page 32

Data View

Widening the lead

*As availability increases, 3380-type drives are prospering at the expense of other direct-access storage devices on IBM and plug-compatible mainframe systems**



*Survey base of approximately 15,000 systems each year

SOURCE: COMPUTER INTELLIGENCE
CW CHART: FRANK C. O'CONNELL

HARD BITS

Kodak flashes image sensor

Eastman Kodak Co. said its research scientists recently fabricated an ultra-high-resolution image sensor with four million pixel elements, which it said is more than double the pixel elements of current sensors. High-resolution image sensors are used in high-speed video motion analysis, vision robotics and image processing applications. Kodak introduced a one-million pixel image sensor in 1986.

Silicon Graphics, Inc. said it recently shipped the 1,000th Personal Iris. Out since October, the machine is the firm's low-end three-dimensional graphics workstation. McDonnell Douglas Corp. received the 1,000th system, which it will use in commercial jet design operations.

National Customer Engineering, Inc. recently an-

Continued on page 31

Inside

- AS/400 server minibar maker. Page 29.
- Intergraph unveils new workstation line. Page 29.
- Contel Business Systems serves up a 32-bit computer for restaurants. Page 34.

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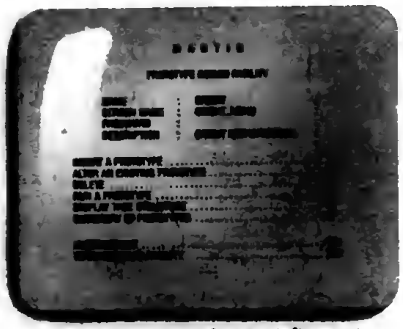

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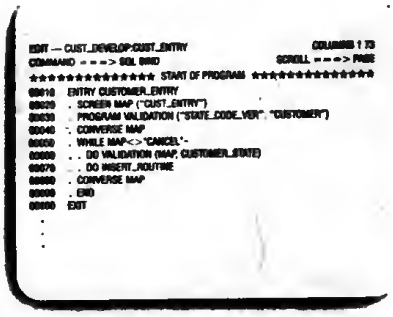

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HARD TALK

Rosemary Hamilton

Little guys get stacked DEC

In the second week of January 1986, Digital Equipment Corp. rolled out its Vaxstation II/GPX, a Unix-based color graphics workstation.

The announcement was perceived as DEC's first real aggressive push for workstation business and, as such, it was viewed as a serious threat to Sun Microsystems and Apollo — both then considered relatively small companies with potential. Sun had its own announcement that week, a workstation for less than $8,000. But, given Sun's status, it gained relatively minor press coverage.

The DEC initiative and its impact on these competitors was the real story, and it got front-page *Computerworld* coverage as a result. In that DEC story, a Sun spokesman responded to the DEC news by saying, "In general, it's good for us to have someone like DEC making a commitment to Unix."

My, how things have changed. And as far as users are concerned, it's a change for the better.

Last week, DEC hit the market with a slew of workstations. In a soup-to-nuts strategy, DEC came out with personal computers, workstations and a reduced instruction set computing (RISC)-based system.

Despite this onslaught, the

Continued on page 31

AS/400 serves minibar maker

Runs factories in three states and supports 150 users nationwide

ON SITE

BY JEAN S. BOZMAN
CW STAFF

LAGRANGE, Ind. — A month-old IBM Application System/400 Model 60 has put MIS in the catbird seat at Dometic Corp., a manufacturer of appliances for recreational vehicles. The 48M-byte machine allows one MIS group to run factories in three states and supports 150 users nationwide.

The data center of the $225 million Dometic, based in Elkhart, Ind., is located here. From this point, 14.4K bit/sec. long-distance telecommunications lines reach out to factories in Elkhart and Evansville, Ind., to Sarasota, Fla., and Santa Ana, Calif.

Long-line costs range up to $3,000 a month, but they are less than the potential costs of having remote processors at each site, said Ken Buckler, Dometic's controller, who manages the information systems department. Dometic's star configuration suits the needs of its rapidly growing business, which tripled its revenue in the last three years by selling such recreational-vehicle amenities as minibars.

Way to go

"We think a centralized system is the way to go," Buckler explained. "It makes maintenance a lot easier, and it makes upgrades easier, so everyone's taking advantage of the latest programs." It also allows a small data processing staff of four to support the 1,000-employee company, which is a subsidiary of the Swedish AB Electrolux appliance conglomerate.

Buckler said that his small staff also gains great leverage by sticking with standard IBM products — and with third-party software.

"Most companies are trying to do their own thing," Buckler said. "They write their own programs, and by the time they're through, the programs are technically obsolete. We spend far less than other companies do, but we're getting better results by letting IBM and application software provider System Software Associates, Inc. [SSA] in Chicago cope with the changing technology."

All the application software was written by SSA, whose Business Planning and Control System (BPCS) contains 25 modules that handle everything from accounts payable and receivable to scheduling, shop-floor control and manufacturing resource planning. Systems analyst Sandy Smith said Dometic has implemented 15 of the BPCS modules.

BPCS, which replaced a manufacturing accounting and production information control system on an IBM System/38, is a

One of *Dometic's appliances*

real-time system that updates all company activities on a day-to-day basis.

Dometic's end users are en-

Continued on page 32

Intergraph airs another RISC-based series

BY JAMES DALY
CW STAFF

HUNTSVILLE, Ala. — Intergraph Corp. joined the winter harvest of firms offering products for the desk top recently, when it unveiled a new line of reduced instruction set computing workstations and servers.

The five-member 3000 series will be based around the firm's C300 Clipper microprocessor, which is capable of processing 10 million instructions per second (MIPS). The firm said the products will offer full binary compatibility, ensuring that software created on earlier generations of Intergraph workstations will run without modification.

All of the 3000 series Interpro workstations also include an Intel Corp. 80386 I/O processor and custom graphics processors. Memory options for the series range from 16M to 112M bytes of main memory. Disk options can extend the Interpro's disk capacity from a standard 355M- or 670M-byte capacity to up to 7G bytes.

The Interpro 3050 and 3060

Continued on page 32

SOFT NOTES

BMC carves $4.5M deal

BMC Software, Inc. said it signed a purchase agreement to acquire the Toronto-based **Trimar Software Systems Ltd.'s** IMS/VS Fast Path software products. The $4.5 million deal will be closed early this year, both firms said.

BMC, based in Sugar Land, Texas, said it plans to keep all Trimar employees and to maintain the Toronto office for ongoing IMS/VS Fast Path product development.

Usenix Association will host sessions by both the Open Software Foundation (OSF) and Unix International, Inc. at the association's winter conference. The OSF session is scheduled for Jan. 31, from 8 p.m. to 10 p.m. The Unix International session is scheduled for Feb. 2, from 7:30 p.m. to 9 p.m.

The conference will be held at the Town & Country Inn in San Diego from Jan. 30 to Feb. 3. For more information, call 213-592-3243.

Information Builders UK Ltd. said that Barclay's Bank extended an order for Focus for VAX, Information Builders' fourth-generation language and database management system. The contract is the second that Barclay's has signed with Information Builders this year and in-

Continued on page 31

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Hamilton

CONTINUED FROM PAGE 29

1989 announcement was not as threatening a move as that single DEC Unix box was three years ago, as far as industry observers are concerned.

Why? Because its competitors are no longer just small companies with some potential. Instead of going after the little guys as it did then, DEC is now trying to hold serious competitors back. That's good news for DEC users and workstation users in general. DEC is holding the little guys back by coming out with systems that should have been out sooner, meaning users can finally get what they want.

Give and take

In the three years since the Vaxstation/II GPX was unveiled, DEC continued to upgrade its workstation line but didn't offer the razzle-dazzle three-dimensional graphics that some users required. It kept its pricing fairly aggressive but didn't boost the raw performance to a level that users wanted. It kept up with its Unix offering, Ultrix, but never gave the industry a sense that it was seriously behind Unix.

Sun spent those three years spreading the Unix word. It sailed past DEC in performance by coming out with a RISC-based system that came in around 10 million instructions per second (MIPS) in late 1987. Meanwhile, two other companies — former market leader Apollo and Silicon Graphics — kept up with performance and also concentrated on putting out some of the best 3-D graphics systems on the market.

All of this meant that users had to look somewhere other than DEC when it came to three major areas: high-powered graphics, performance and a serious commitment to Unix. And look elsewhere they did. But DEC's announcement last week shows that DEC is very aware of that fact.

So we saw a big push for Unix, as Ultrix took on a starring role in the announcement. We saw a VMS-based system that goes into the estimated 10-plus MIPS range. We saw an Ultrix-only RISC-based workstation that offers an estimated 14-plus MIPS. There still wasn't a high-quality 3-D graphics component, but most analysts agree that this has become a high-end niche in the market that not all vendors need address.

Some observers reacted to DEC's rollout by saying it was trying to do too much and would confuse users by offering so many systems. Perhaps, but DEC's announcement is also giving DEC users, and other users as well, more of what they want than ever before. The question now is how much of an advantage over DEC have the one-time little guys established since that January in 1986.

Hamilton is *Computerworld*'s senior editor, systems.

Hard bits

CONTINUED FROM PAGE 27

nounced maintenance support for Sun Microsystems, Inc. workstations and peripherals. The company, headquartered in San Diego, has a total of 33 regional service centers.

Briggs & Stratton Corp., a manufacturer of small gasoline engines, recently bought a **Control Data Corp.** Cyber 960 mainframe and 41 Cyber 910-400 graphics workstations. The CDC system will be used for design and engineering applications.

Unisys Corp. won an $8 million contract from United Airlines for a 2200/600 series and a 1100/92 series mainframe computer. The systems will be used as part of the airline's effort to consolide its San Francisco and Chicago data centers into one center in Chicago. The 2200/600 is intended to be used as part of United's Unimatic flight operations application, which is currently running on a Unisys 1100/93 mainframe.

Soft notes

CONTINUED FROM PAGE 29

cludes the acquisition of 63 additional site licenses.

Envos Corp., a spin-off of Xerox Corp.'s Artificial Intelligence Business Unit, recently signed a $4 million deal with Sun Microsystems, Inc. that will enable Envos to bundle its artificial intelligence development environment with Sun-4 workstations.

Synon, Inc. and **Pansophic Systems, Inc.** announced that they have reached an agreement that calls for Pansophic to no longer sell the Synon/2 computer-aided software engineering tool under a Pansophic label. Synon will be the exclusive provider of the software tool, which has been sold by Pansophic as part of its Telon product line.

Synon said it will continue to support the Pansophic customers, who purchased the product as Telon/38 for the IBM mid-range platform.

The Saddlebrook Corp. said it plans to resell the **Ross Systems** Renaissance series of financial and management accounting products.

The licensing agreement formed between the two companies gives Saddlebrook exclusive rights to the software for the thrift and mortgage banking market in the U.S.

"Obviously, these people never considered the advantages of incorporating planned rentals into their capital equipment acquisition strategy."

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Gibson

CONTINUED FROM PAGE 27

dred spirits in computing as if to say, "If we made a personal computer, it would be the Macintosh."

One year later, at what DEC called its most important desktop unveiling and most comprehensive announcement ever, Sculley and Apple were mighty scarce. Macintoshes were mentioned in passing as simply one of the myriad desktop devices to which DEC connects.

The absence of Decwindows on the Mac is the reason Apple was not in the spotlight this time. Although the two firms are supposedly still busily at work in joint development, it is unclear what they are working on.

The other deficient aspect of the announcement was the absence of Decwindows Display Facility software, which is said to enable PC users to access Decwindows applications residing and executing on other systems.

DEC had sent out the message that it was bringing Decwindows to Microsoft's MS-DOS.

But DEC pulled its punch, saying that the facility "will be part of a future release of Digital's PC integration software available later this year." There was no price. There was no availability date. And this from a company that claims to "have it now."

Indeed, Decwindows will never run on an MS-DOS-based PC; it will run on a server to which the PC is connected. Although Decwindows uses up lots of memory and is too large to be contained in MS-DOS, it could be accessed in expanded memory as virtual disk.

A final thought. The Decstation 3100 is based on the Mips Computer Systems reduced instruction set computing microprocessor and runs Ultrix, DEC's version of AT&T's Unix. Ardent Computer makes a "personal supercomputer" that uses multiple Mips microprocessors and runs a variant of Unix.

Why doesn't DEC just acquire Ardent instead of developing its own multiprocessor version of its Decstation 3100? That way, it could quickly expand its product line and at the same time bring Gordon Bell, the creator of DEC's VAX line who is now working for Ardent, back into the fold.

Gibson is *Computerworld's* senior editor, software.

Honeywell Bull

CONTINUED FROM PAGE 27

Bull's XPS 100 version of AT&T's Unix, the company said. Multics is a large-scale operating system that once established a small but devoted following of Honeywell users.

A number of Multics users were outraged almost three years ago when Honeywell announced at a users' meeting that Multics would not be enhanced further. At a later meeting, some users wore black armbands as an expression of protest.

Developed 19 years ago, Multics had advanced features such as a built-in relational database. However, it was designed for 36-bit hardware, which Honeywell dropped in favor of 32-bit systems.

Honeywell Bull told users it would offer a Multics-like follow-on operating system by 1988. That project, however, never came to fruition, and it was announced last spring that Multics users would be urged to migrate to XPS 100.

"At the time we made the announcement, we were going to make a revolutionary change to GCOS 6 for our DPS 6 user base," said Garry Kaiser, Multics marketing manager for Honeywell Bull. "Those changes were going to be very Multics-like." It was later decided that only incremental changes would be made to GCOS 6.

ACTC, which has already been handling some Multics support, will develop software and tools to help users migrate to XPS 100. Support for migration to the Open Software Foundation's OSF1 version of Unix will be offered later, Kaiser said. Honeywell Bull is an OSF founder.

Minibar maker

CONTINUED FROM PAGE 29

couraged to use the BPCS to check sales and inventory at will. They are also reminded to print out their own reports rather than ask the DP staff to do so. "This machine has placed the system in the hands of the end users," Buckler said.

Dometic's AS/400 Model 60 was installed in early December, replacing an IBM System/38 Model 600. The system was acquired under IBM Credit Corp.'s new AS/400 Total System Lease program and was installed by a single IBM field engineer.

Dometic's Buckler

The conversion to the AS/400 was made during a weekend; Dometic never even considered running the two production systems in parallel. When one major problem cropped up, Dometic used the AS/400 remote maintenance feature to diagnose an overheated disk-drive component. IBM installed a replacement part the following day.

Preparation for the changeover from the System/38 was minimal. "We assigned two programmers to the night shift for a while, so they could work on a dedicated machine," Buckler said. "Beginning on a Friday night, we started dragging data files across from the System/38 to the AS/400. By Monday morning, we were up and running."

Intergraph series

CONTINUED FROM PAGE 29

workstations will each sport a 19-in. 1M-pixel display screen and sell for $45,000 and $55,000, respectively. The 3070 offers a 27-in. 2M-pixel display screen and is priced at $56,000. All are available immediately.

Intergraph officials also confirmed that the company's 300 series workstations can be field-upgraded to 3000 series specifications by replacing the older processor with the 10-MIPS C300 Clipper processor. They added that pricing for the new chip has not yet been established.

The pair of servers — the Interserve 3005 and Interserve 4000 — were designed for shared-compute and file-server applications. The Interserve 3005 is a single-bay server configured with 670M to 6G bytes of disk capacity; it will sell for $44,000. The two-bay Interserve 4000 was designed for larger jobs and provides 584[illegible] to 23G bytes of disk memory; it will be priced at $98,000.

The firm also announced price reductions of up to 37% on the Clipper C100 microprocessor, the C300's predecessor.

Intergraph spokesmen said the announcement was moved up a few days so it would not occur the same week Digital Equipment Corp. unleashed a series of machines designed for desktop users [CW, Jan. 9]. "In the PR wars of the world, it's very hard to go up against DEC and all the blabbing that's going to go on with that announcement," spokesman George Ralls said. "This way, we figured we can sit down and talk with our customers and avoid all the hoopla."

IBM 3990

CONTINUED FROM PAGE 27

users added. "First and foremost was the four-way pathing, but we also went to a 4.5M bit/sec. channel speed," said Keith Volkmar, director of operations at Blue Cross/Blue Shield of Rochester in New York. Volkmar's previous controller, a 3880, had a 3M bit/sec. channel speed.

Many users opted to phase in the Model 3 in three steps, a plan for which IBM offered a small discount of 2% or 3% off the total controller price. Early in fall 1988, a base Model 3, which is actually a 3990 Model 2, was offered. One user jokingly referred to it as the "Model 3 Minus." In December, the microcode necessary to use the cache was delivered. An early support program for the Extended Features is scheduled for the first half of this year.

"We were concerned when they first said it would be delayed to the first quarter of 1989, but then they offered us the discount," Volkmar said. "Since we were coming from a noncache environment, it worked out OK. We didn't need the boost from the cache right off the bat."

As far as the Extended Features go, Volkmar said, "I'm looking at it as an extra. When they come, they come."

Other users are as accepting of the shipment schedule as Volkmar, because each phase brings performance boosts.

"Even running it as a Model 2 had advantages," said Mike Dille, managing director of data processing at Fingerhut Corp. in Minneapolis. "It doubled the number of paths, which itself gave us performance gains," he said of the four-way pathing featured in the base Model 3.

Fingerhut received the cache capability microcode in December and gained performance boosts ranging from 12% to 20%, Dille said. For example, Dille's staff compiled data that compared I/O operations for an IBM IMS application using a 3880 controller with cache and a 3990 controller with cache. The staff did not change disk drives, which are 3380 Model Ks. With a disk volume of nearly 1.9G bytes, the system performed 12 I/Os per second using a 3880. With the same disk volume and the 3990, 14 I/Os per second were performed.

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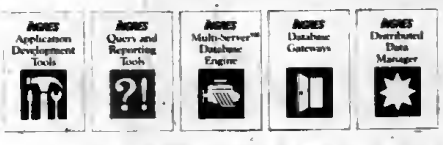

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See us at the Federal Computer Conference, #555; and UNIX Expo, #449.

NEW PRODUCTS — SYSTEMS

Processors

Contel Business Systems, Inc. has unveiled a line of 32-bit computers with enhanced applications for the restaurant industry.

Dubbed the **Contel Solution/1** series, the Intel Corp. 80386-based system reportedly features multiuser capabilities and performs restaurant-to-restaurant networking functions. The main processor operates under the AT&T Unix System V Release 3 operating system, according to the vendor, and the coprocessors run within a proprietary operating environment.

Contel Solution/1 computers range in price from $12,000 to more than $40,000, depending on system configuration and cabling requirements.

Contel, 1 Dedham Place, Dedham, Mass. 02026. 616-461-6400.

Symbolics, Inc.'s Graphics Division has announced an add-on rendering system designed to allow present users to increase rendering power in a cost-effective way.

The **3653** dual-purpose graphics system reportedly allows users to install up to three CPUs in the 3653 computer. The add-on CPUs can also serve as black-and-white workstations for modeling and animation design, according to the vendor.

The 3653 includes one CPU with 4M words of memory and a 380M-byte enhanced small device interface disk. It is priced at $59,850 from now until March 31. Additional 3653 CPU upgrades are available for $35,950 each.

Symbolics, 1401 Westwood Blvd., Los Angeles, Calif. 90024. 213-478-0681.

Data storage

Real Time Enterprises, Inc. has expanded its RTE Optical Disk File Manager (ODFM) product family.

The ODFM line was designed to provide on-line access to the Optimem non-erasable optical disk drive for Apollo Computer, Inc. computers. The latest addition, the **ODFM-300**, reportedly offers support for the new Optimem drive, the Model 2400. The double-sided ODFM-300 has 1.2G bytes/side, the vendor said, and is suitable for all applications that require random access to large databases of permanent or historical data.

The ODFM-300 costs $20,060.

Real Time Enterprises, 3000 Winton Road S., Rochester, N.Y. 14623. 716-427-8090.

NEW PRODUCTS — SOFTWARE

Applications packages

Spectrum Information Systems Programming, Inc. has announced that its **System/36 Distribution and Light Manufacturers** application software will be available in native mode for the IBM Application System/400 mid-range computer.

Scheduled for delivery in April, the base package with source code will be priced from $32,000 to $56,000, depending on processor model.

Spectrum, 1990 S. Santa Cruz, Anaheim, Calif. 92805. 714-937-1311.

Control Data Corp. has announced that it has added a set of programs for manufacturing automation to the company's **Integrated Computer-Aided Engineering and Manufacturing** (ICEM) software.

The programs are collectively labeled ICEM Robcad and are designed to run on CDC Cyber 910 engineering workstations. The software can simulate and optimize automation systems, as well as prepare installation drawings and program robotic controllers, the vendor said.

ICEM Robcad is priced from $45,000.

CDC, P.O. Box 0, Minneapolis, Minn. 55440. 800-553-2215.

Utilities

Softool Corp. has released **Version 3.0** of its **Change and Configuration Control** (CCC) software for Harris Corp.'s HCX/UX users.

The latest release offers support for multiple levels of modules, absolute path names, database and journal file integrity checkers and an enhanced build facility, according to the vendor.

CCC for the Harris HCX/UX system is priced at $30,000.

Softool, 340 Kellogg Ave., Goleta, Calif. 93117. 805-683-5777.

Software Partners/32, Inc. has enhanced its remote device access system software for Digital Equipment Corp.' VAX/VMS environments.

Version 2.0 of **Thruway** offers increased Decnet file and transfer capabilities and now handles remote printing of files on other nodes in the network, the vendor said. Current users will receive Version 2.0 has part of their warranty upgrade program.

Thruway 2.0 can be licensed for $4,000 for the first two CPUs, regardless of processor size.

Software Partners/32, 447 Old Boston Road, Topsfield, Mass. 01983. 508-887-6409.

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Digital announces a new line of products which brings the proven superiority of distributed computing to a totally new level.

Introducing the world's most powerful desktop computers.

Until now, desktop computer power has been measured by what you can do *at* your desk.

According to experts, the true measure of power will be what you can do *from* your desk. And that takes complete hardware and software integration.

Today, there's one company with a family of desktop computing systems whose power, by both these measures, is second to none. Digital.

Powerful new hardware.

For PC users, there's the DECstation™ 210, 316 and 320 systems—the first industry-standard PCs sold and supported by Digital.

For UNIX® users, there's the DECstation 3100 workstation. Its state-of-the-art RISC technology makes it the fastest desktop workstation in the world today.

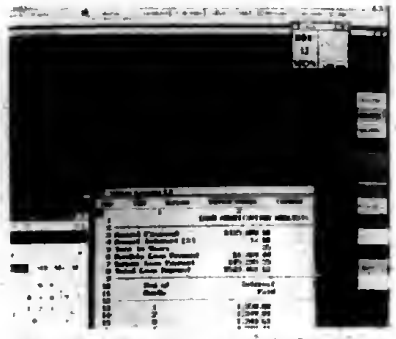
For those who want it all, there's the VAXstation™ 3100 workstation. It's a VAX™ workstation that runs the VMS™ operating system and industry-standard UNIX and can run MS-DOS® applications as well. Its price/performance is triple the world's best-selling workstation—our own VAXstation 2000.

To complete the picture, there's the VAXstation 3520 and 3540 systems. They give you all the power you need in 2-D and 3-D graphics workstations.

digital

Powerful new software.

Our new DECwindows™ desktop software, part of Digital's Network Applications Support,™ offers something no other windowing system can. The ability to access applications across operating systems.



With DECwindow software, you can display VMS, UNIX and MS-DOS applications at the same time.

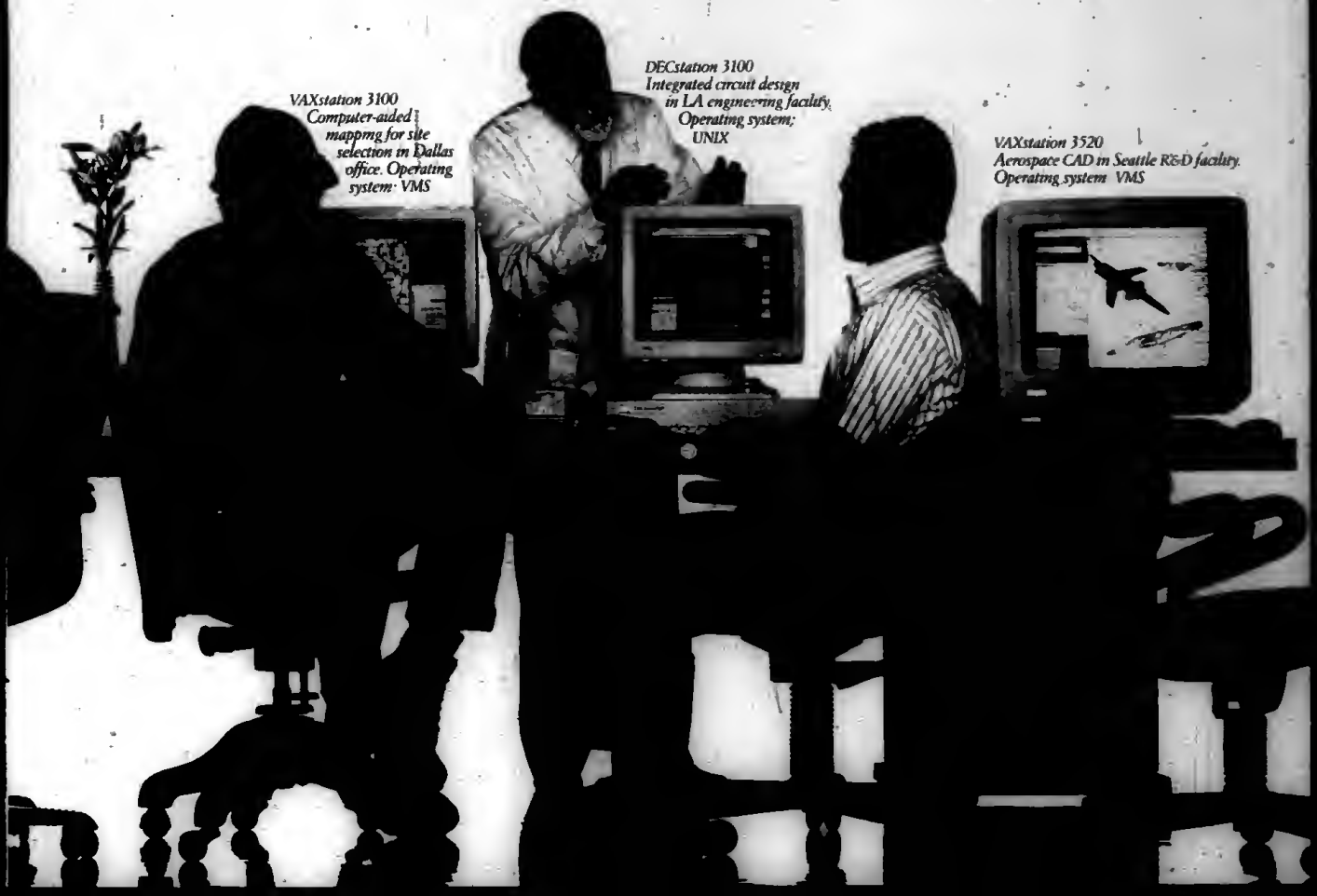
Imagine the possibilities. If your desktop computer runs the VMS operating system, you can display VMS applications, plus applications from any UNIX or MS-DOS computer. The same is true if you're running a UNIX system. Whether you're a user or an applications developer, with DECwindows software there's one, easy-to-use interface that's the same across operating systems. You can display text, graphics and imaging all at the same time.

Behind it all, standards.

Our ability today to offer such total, systemwide integration comes from years of experience working for a single goal. To make it easy for people to work together. And that demands an adherence to standards.

It's why we've taken a leading role in standards bodies, championing the adoption of open standards. It's why we're the leaders in networking, with more multivendor networks than anyone else. And it's why we back up our products with worldwide, world-renowned service.

Now, with our family of desktop computing systems that lets information be shared from desk to desk anywhere in the world, we'd like to show you how much more productive everyone in your company can be.



Now anyone can have a window office.

With DECwindows software on a VAXstation 3100 workstation, getting the whole picture is easier than ever.

digital

Our new DECwindows desktop software, part of Digital's Network Applications Support, opens up a whole new way to look at windows. Because it lets you do the one thing no other windowing system can – share applications across operating systems.

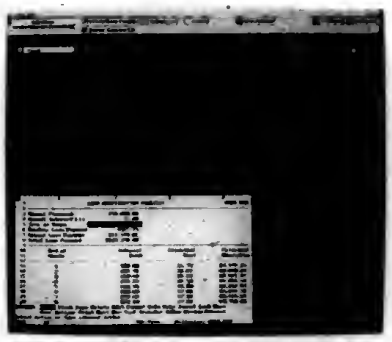
Here's how it works.

If your desktop computer runs the VMS operating system, you can display VMS applications, plus applications from any UNIX or MS-DOS computer. The same is true if you're running a UNIX system. You even have access to applications running on large computers like VAX, IBM® and Cray systems.

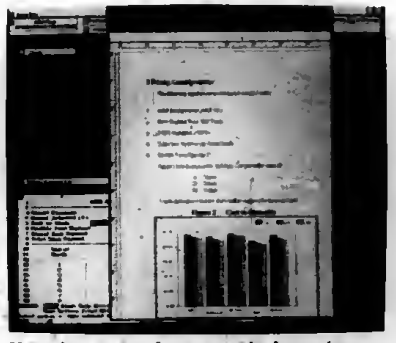
The beauty of it is, it isn't complicated. DECwindows software makes it very simple.

Whether you're a user or an applications developer, with DECwindows software there's one, easy-to-use interface that's the same across operating systems. You can display text, graphics and imaging all at the same time. And with our new DECwrite™ and DECdecision™ software, you can link your document's information with its source. Whenever it changes there, your document can be instantly revised.

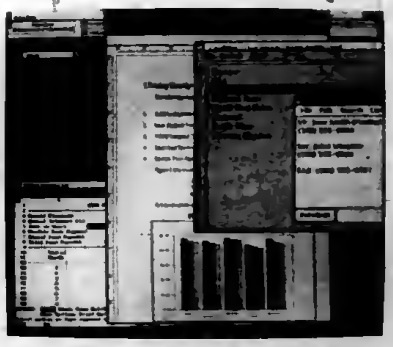
DECwindows desktop software. It's your window for integrating all the computing resources of the organization. All right from your desk.



One easy-to-use interface lets you display applications across operating systems. You can display financial projections running on your MS-DOS computer.



Using the same interface, you can display graphics running on a VMS computer to update your report.



Just as easily, you can display a file from a UNIX computer. It's all yours to manipulate the way you want.

Now anyone with a PC can join the company.

Program development on a VAXstation 3100 workstation in one department can be shared with programmers in other departments.

The PCLAN/Server 2000 system lets PC and workstation users share information across the network – locally or company-wide.

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If you just want to tie your PCs together in a local area network, any PC LAN vendor will do.

But, if you want to tie your PCs together and make them an integral part of your company's network, any PC LAN vendor won't do. Because it's not what they do. It is, however, something Digital does better than anyone else.

With our PCLAN/Server™ 2000 system, the latest implementation of Digital's Network Applications Support, you can easily tie together PCs from major manufacturers like Apple,® COMPAQ,® IBM, Olivetti and Zenith. Besides letting PC users share information with each other, the PCLAN/Server 2000 system lets them share information with any computer on the network – no matter what size it is, no matter where it's located. It's the kind of total integration that only Digital can deliver.

Because the PCLAN/Server 2000 system is powered by VAX technology, not PC technology, users can avoid the usual LAN bottlenecks that slow down their access to information. Because it's VAX technology, it also means you can grow in any direction you choose. And finally, Digital offers full service and support for any system on the network.

The PCLAN/Server 2000 system.™ All the resources of your company's network are now available on a local area network.

Figures from a spreadsheet analysis on a Macintosh SE® in the field can be used to update reports in the regional office.

Results from a manufacturing application on an IBM PS/2® on the factory floor can be incorporated in marketing at headquarters.

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From the beginning, our success, as well as the success of the leading companies we work with throughout the world, has been based on a single vision. To design totally integrated computer systems that work together so people can work together.

With the introduction of our new desktop computing systems and DECwindows software, we extend the vision even further. Now there's one company that provides total hardware integration to join your company at every level. One company that provides total software integration to make software a common resource shared by all. One company that provides total service and support to make sure it all works the way you want it to work.

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To learn more, write to Digital Equipment Corporation, Desktop Products (ZI), MKO1/W83, Continental Boulevard, Merrimack, NH 03054-9987.

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MICROCOMPUTING

MICRO BITS

Douglas Barney

Frank bucks the big guns

Cut Frank a break. Frank Rogers thought he would do something good for personal computer software customers. So after hours he wrote a $69 Ashton-Tate Dbase-compatible program, quit his job as an MIS director and formed 1 on 1 Computer Solutions, Inc. in Trumbull, Conn., to market the thing. Based on the letters Frank received from customers (and forwarded to us), 1 Plus 1 = 3 is quite a value. But Rogers may well wonder whether it waa wise to resign from a comfortable position as an MIS manager to enter the cutthroat world of micro software.

First Frank got into a beef with Fox Software. He bought the Foxbase Dbase-compatible compiler to develop applications and called the company to ask if there was a limit to what he could write. The answer waa no. So Frank used Foxbase to write his Dbase compatible. Fox didn't like it, but it had to live with it.

Now Frank is in danger of offending Ashton-Tate. In a magnificent display of saber-rattling, company Chairman Ed

Continued on page 48

Wang 800 line rings few bells

BY WILLIAM BRANDEL
CW STAFF

With its new mail-order program, Wang Microsystems aims to make ordering equipment as easy as making a toll-free telephone call, but MIS managers say they are not ready to let their fingers do the walking.

For many information systems purchasers, the direct-dial ordering concept triggers mail-order flashbacks and nightmares: late deliveries, no service or support and nasty surprises when they open the shipping boxes. In addition to mail order's tainted image in the minds of many MIS managers, the Wang Laboratories, Inc. division has its own image problems to overcome if it is to call MIS managers to the phone.

Wang user Joseph Ianello, corporate MIS manager at Amerada Hess Corp. in Woodbridge, N.J., said, "Any 800 number in and of itself gets no reaction from us."

"Maybe in a different situation, it would interest me," said Jean Gibour, MIS manager at EIS Brake Parts in Berlin, Conn. "But we deal with the local distributor, who supports their products and is nearby. I've gotten a little spoiled by that."

However, Wang's latest marketing approach may be its best chance of broadening its presence in the personal computer market. Analysts have noted that Wang has been locked out of many PC distribution channels, which has impeded the company from breaking into the corporate environment in many instances.

Bruce Stephen, PC analyst at International Data Corp., a Framingham, Mass.-based market research firm, said that considering Wang's obstacles in get-

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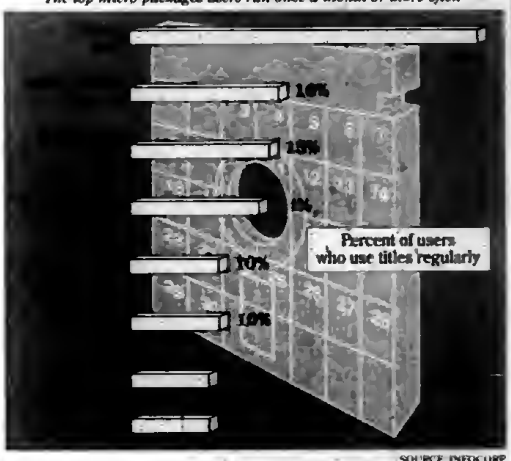
Data View

Habit forming

The top micro packages users run once a month or more often



SOURCE: INFOCORP
CW CHART: JOHN YORK

Microsoft takes aim at C market

BY DOUGLAS BARNEY
CW STAFF

Computer languages are not supposed to he easy to use, but don't tell that to Microsoft Corp. The firm is working to shorten the learning curve needed with its products by using built-in computer-based training and a hypertext-based Help system.

The latest Microsoft language to receive this treatment is Microsoft QuickC 2.0. This product is locked in a vicious tug-of-war for a share of the low-end market with Borland International's Turbo C.

Continued on page 47

Patents put on CD-ROM

BY MICHAEL ALEXANDER
CW STAFF

This month, the U.S. Patent and Trademark Office (PTO) will inaugurate a program using compact disk/read-only memory technology that promises to save taxpayers in excess of $300,000 each year.

Previously, the PTO had been using an on-line patent information data service to disseminate abstracts of patents, files on corporations holding patents and other information to its nationwide network of 62 patent depository libraries.

With the cost of the Classification and Search Support Information System (CASSIS) on-line service rising at an annual rate of more than 20% in recent years, the on-line costs were cutting deeply into the PTO's budgets. The costs had become so prohibitive that the PTO was forced to stop expanding its network of libraries in 1985, explained William Lawson, director of documentation of the PTO.

Continued on page 48

Inside

- Five remote communications packages considered. Page 45.
- CASE:W gives a boost to Windows programmers. Page 48.

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For instance, if you're currently linked via coax or modem but you plan to switch to a LAN, EXTRA! gives you the freedom to connect all three ways. And that includes LANs using IBM's Token-Ring Interface Coupler (TIC).

It's flexibility like this that prompted *PC Magazine* to name EXTRA! as its Editor's Choice for PC-to-host software running on LANs.

There's something else we don't want you to forget about EXTRA! It's your memory. EXTRA! uses so little of it, you'll have plenty of RAM left on your PC.

Plus, Attachmate's devotion to total IBM® compatibility assures you that you'll never get dead-ended by proprietary protocols.

Which reminds us of something else Houdini used to say, *"Don't get into anything you can't get out of later."*

PC MAGAZINE EDITOR'S CHOICE

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Attachmate Corporation, Bellevue Washington has trademarked EXTRA! Connectivity Software. IBM is a registered trademark of International Business Machines Corporation

Presenting The Houdini Theory Of Micro-To-Mainframe Connectivity.

REVIEWS/NEW PRODUCTS

What makes the grade in remote software?

Remote communications software is similar to traditional communications programs because you can perform remote telecommunications. In addition, you have the ability to remotely control another computer as if it were your own.

The five packages in this review and comparison share a number of features, including phone directories, chat windows that allow interactive on-line conversations between the remote and host users, remote printing, file transfer and security.

Test results
Product comparisons of remote communications software

	Carbon Copy Plus	Close-Up	Co-Compute	PC Anywhere III	Remote 2
Performance Speed	Satisfactory	Good	Excellent	Good	Good
Compatibility	Very good	Good	Satisfactory	Good	Satisfactory
Security	Very good	Very good	Satisfactory	Very good	Very good
Session logging/ recording	Very good	Very good	N/A	Very good	Satisfactory
Documentation	Good	Satisfactory	Satisfactory	Good	Very good
Ease of learning	Satisfactory	Very good	Satisfactory	Very good	Excellent
Ease of use	Good	Very good	Good	Very good	Excellent
Error handling	Good	Good	Very good	Satisfactory	Excellent
Support policies	Good	Satisfactory	Good	Satisfactory	Satisfactory
Technical support	Very good	Very good	Excellent	Poor	Poor
Value	Good	Very good	Good	Good	Excellent

CW CHART FRANK C. O'CONNELL

• Meridian Technology's Carbon Copy Plus Version 5.0

In addition to remote communications functions, Meridian Technology, Inc.'s Carbon Copy Plus Version 5.0 also provides a complete, full-function terminal emulation program.

Features: Carbon Copy Plus contains a host program, CC, which runs all shared applications, and a remote program, CCHelp. The host and remote programs included in one Carbon Copy package cannot be used together.

Carbon Copy Plus' powerful terminal emulator allows you to connect with mainframes, on-line databases and bulletin boards. Another nice touch is a script language, which automates recurring communication activities and supports Honeywell Bull, Inc.'s Kermit, Xmodem, and Ymodem file transfers. A compiler checks script syntax and creates a machine-language module that quickly executes scripts.

Performance: Satisfactory to very good. Performing our standard benchmark tests, Carbon Copy Plus earns a satisfactory score for speed. The wide range of compatible modes and the cross-mode compatibility earn the product a score of very good in compatibility. It is the only program in this review that was capable of working with IBM's Enhanced Graphics Adapter (EGA) on one machine and Color Graphics Adapter (CGA) on another. However, we did run into a few problems.

Security features include a password table that holds valid passwords and phone numbers for fielding incoming calls to the host. An option is available to stipulate the number of password attempts allowed. Another feature enables you to grant varying degrees of host access. Carbon Copy Plus' logging facility will track sessions according to such specifications as Calls Completed, or it will run a continuous audit trail. The Session-Capture feature records an entire session.

Documentation: Good. The manual includes an index, a table of contents, a glossary, a troubleshooting appendix and a quick-reference guide. We stumbled around several times looking for words in the index, and a few references directed us to the wrong page number.

Ease of learning: Satisfactory. Carbon Copy Plus takes more time to learn than the other programs in this comparison. We had to struggle with the print redirection, and installation involves a lot of steps.

Ease of use: Good. Once you have mastered the vocabulary and set your initial parameters, Carbon Copy Plus is not very mysterious to use.

Error handling: Good. The one lockup problem we had was correctable, and all other error-handling capabilities proved to be adequate.

Support: Good to very good. Carbon Copy Plus comes with a 90-day media warranty and a bulletin board that provides patches, limited information and message collecting. Technical support hours are from 9 a.m. to 6 p.m. in both Eastern and Pacific times. We found Meridian's technical support staff to be courteous and eager to help.

Value: Good. Each package sells for $195. Two packages are required. Although it is not as easy to learn as other products in this review, it is a logical choice if you want an all-in-one communications/remote program.

• Norton-Lambert's Close-Up Version 3.00A

Norton-Lambert Corp.'s latest release of Close-Up Version 3.00A is especially useful as a remote support tool.

Features: Close-Up is sold in two parts: Customer/Terminal for the host computer and Support/ACS for the remote system. The Automated Communications System (ACS) is a simple but powerful script language that lets you program the support program to perform unattended tasks. Close-Up provides a traditional terminal emulator that lets you communicate with any other computer. Its special feature is its capability to run in the background.

Performance: Good to very good. Although Close-Up is a little slower at most things than the other programs in this comparison, it earned a good rating in our speed tests. As far as compatibility, Close-Up ran everything we attempted without a hitch, including graphics.

You can set up passwords with varying degrees of file-transfer rights. You can also set up a callback routine for any of the passwords and even specify commands or applications to run automatically once connected. During remote operations, you can disable the host screen, keyboard, or both.

Close-Up keeps normal session logs under whatever file name you want. If you specify the name of an existing log file, the new information is appended to the end of that file. ACS keeps an additional log for script files. You can also videotape your sessions and take snapshots of the

Continued on page 46

THE NEW #1 MICRO-MINI-MAINFRAME PROJECT MANAGEMENT SOLUTION.

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*Time Line is the #1 best-selling project manager (Survey of National Distributors). It also received InfoWorld, PC Magazine and Software Digest's highest 1988 ratings for project management programs.
ARTEMIS is a trademark of Meister Management Systems, Ltd. Training and consulting services available: call 415/888-1919. © 1989 Symantec Corporation

Remote software

CONTINUED FROM PAGE 45

customer's individual screens.

Documentation: Satisfactory. Each module comes with a softcover, ring-bound manual. In place of a tutorial, there are several step-by-step procedural outlines. The table of contents is impressive, but the index is weak. There is no on-line Help.

Ease of learning: Very good. Unless you are a complete novice, you will be able to use Close-Up almost as soon as you get it out of the box.

Ease of use: Very good. Close-Up's Lotus Development Corp.-style menus and pull-down submenus lead you through hardware configuration and basic program operation.

Error handling: Good. When we tried to force errors, Close-Up provided the appropriate error messages. We had trouble with our EGA and CGA display mismatch. Although the program never locked up on us, the CGA caller was left staring at a blank screen.

Support: Satisfactory to very good. Norton-Lambert provides a 90-day media-only warranty. Technical support is available via a toll-free number Monday through Friday between 7 a.m. and 4 p.m. Pacific time. When we called technical support, the technician was immediately available on four of five calls.

Value: Good. Priced at $245 for the host and $195 for the remote, this is the most expensive package in this group. However, it does offer extensive features and reliable operation.

• Co-Compute Version 2.14

Harmony Technology Associate's Co-Compute was designed primarily for collaboration, training and conferencing.

Features: In addition to the standard host/terminal operating mode, Co-Compute offers a symmetric mode in which only keystrokes are transmitted over the phone lines. To do this, the same application is run on both machines in synchronization. This speeds things up by eliminating the transfer of entire images.

Performance: Satisfactory to excellent. We performed our tests for Co-Compute in its symmetric mode. All of our standard tests responded as if you were sitting at the local machine, earning Co-Compute excellent marks for speed.

You should be able to do everything you can do on your computer while in Co-Compute's symmetric mode, as long as your partner's computer is equally equipped. We could not get a screen-image capture with Imcap, a screen utility used to record software screens, while the conferencing menus were displayed. We were also unable to load Aldus Corp.'s Pagemaker remotely or work with Microsoft Corp.'s Word in either text or graphics mode. Co-Compute rates satisfactory for compatibility.

Although Co-Compute does not support any identifiable security features per se, all remote functions must begin with a voice call. Session logging and recording features are not supported.

Documentation: Satisfactory. The manual does a fine job of describing the Co-Compute features but lacks an organized summary of how you make them work. The manual also lacks screen shots and enough illustrations to support the text.

Ease of learning: Satisfactory. Co-Compute takes a while to learn, mostly because of the symmetric mode. Installation is straightforward.

Ease of use: Good. Once learned, using Co-Compute is quick and easy, although keeping in sync in symmetric mode takes some getting used to.

Error handling: Very good. We did not lock up while using the program. Co-Compute is relatively foolproof.

Support: Good to excellent. Harmony offers a 90-day media warranty with a toll-free support number. Support hours are from 8 a.m. to 6 p.m. Pacific time, Monday through Friday. We called technical support a couple of times when no one was available. Our calls were promptly returned. The staff answered our questions clearly and accurately.

Value: Good. The package sells for $123.75 per module. Two modules are required. We do not think it is the program of choice for support applications, but we like it for collaboration or training.

• DMA's PC Anywhere III Release 3.00

DMA, Inc.'s PC Anywhere offers all features of a first-rate remote-control program.

Features: The PC Anywhere package contains separate program disks for the host and remote computer; Anywhere runs on the host system and Aterm runs on the remote system. However, you can use almost any communications program on the remote computer. In fact, the remote computer does not even have to be an IBM Personal Computer compatible. PC Anywhere has built-in support for more than 30 terminals.

The automatic mode lets Anywhere sit in the background and wait for calls, but it leaves you without direct control over whether a call will be answered. The resident mode puts Anywhere in the background on standby, waiting for you to press the hot keys to access the menu. The menu lets you direct Anywhere to wait for a call, initiate a call or put Anywhere into the automatic, resident or disabled mode.

Performance: Good to very good. For our standard benchmark tests, PC Anywhere was on par with most of the other remote products, earning a good rating for speed. We tested the package

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*There will be a minimal charge of $50 for either an X.25 or V.42 upgrade on products purchased before October 1, 1988. Products purchased on or after October 1, 1988 will include either standard as they become available. For details call Hayes Customer Service: 404-441-1617

with a variety of software with little conflict, earning another good rating for compatibility. PC Anywhere's security functions let you designate a master password, up to 64 individual passwords or no passwords at all. You can also specify commands to be executed as soon as a caller is connected.

The session-logging routine records who called, the session start and stop times and the operator's comments. You can prepare formatted activity reports and billing reports and print them to a printer, screen or files. It also includes an archiving function. Aterm's session-recording function lets you take snapshots of screens.

Documentation: Good. PC Anywhere's manual is professionally prepared and well laid out. The table of contents and index are complete, but there is no tutorial. On-line Help is limited.

Ease of learning: Very good. Most procedures are intuitive or clearly prompted. Users with basic computer knowledge should be up and running in a few hours.

Ease of use: Very good. Most operations are intuitive and clearly prompted.

Error handling: Satisfactory. In most cases, PC Anywhere handled errors smoothly. However, we did encounter trouble with the voice-to-data switching at 2,400 bit/sec. and with our IBM EGA and CGA display mismatch.

Support: Poor to satisfactory. DMA licenses PC Anywhere on an as-is basis without a warranty. It offers technical support Monday through Friday, 9 a.m. to 5 p.m. Eastern time via a toll-free call. We had difficulty reaching technical support by phone. When we did, the assistance was fairly helpful.

Value: Good. If you need a program to run your own computer remotely or provide support to a single client, the $145 PC Anywhere package is as good as any.

• Crosstalk Communications' Remote 2 Version 1.00

Crosstalk Communications Co.'s Remote 2 is one of those all-too-rare packages that feels right while you are using it.

Features: Crosstalk markets Remote 2 as a two-module set, including R2Host for the host users and R2Call for the remote user. You can buy the modules separately. You can also use Crosstalk Mk.4 or Crosstalk XVI on the remote computer with minimal loss in capability. If you do not have either of these programs, you can use a terminal emulation program — or even just a simple dumb terminal.

R2Host runs in one of three modes. The Always Ready mode puts R2Host in the background to answer incoming calls automatically. The Manual mode is similar, except that the host operator must direct R2Host to answer calls. The Restart runs in the foreground and turns the host computer into a dedicated host, unavailable for local use. Remote 2 lacks voice/data switching, session recording and a call-out capability for the host.

Performance: Satisfactory to very good. Remote 2 is slower than the others at updating text displays. However, it paints graphics screens faster than any of the rest. We rate Remote 2's speed as good.

Imcap, a screen utility used to take pictures of software screens, was unable to capture on-line R2Host messages, earning a satisfactory rating for compatibility. Security options let you make Remote 2's host as secure or as open as you like. Session logging is less detailed for Remote 2 than other products in this review.

R2Call logs outgoing calls, recording the host name, time, date, duration and comments. R2Host logs each caller's user ID, time, date, duration of call and unsuccessful logon attempts. Session recording is not provided.

Documentation: Very good. Remote 2 comes with two well-written ring-bound manuals. They include detailed tables of contents and indexes. Clear instructions lead you through each function, explaining processes fully. In addition, Remote 2 has on-line context-sensitive Help.

Ease of learning: Excellent. Users with a moderate level of computer communication experience should be running their first successful on-line sessions within a few hours. Installation is quick and easy.

Ease of use: Excellent. We were impressed with how well things work and fit together. Remote 2 does not require you to remember much more than a couple of hot keys.

Error handling: Excellent. Remote 2 either handled our errors without a problem or, in the case of mismatched bit/sec. rates, would not establish the link. Remote 2 uses a special error-correction routine to eliminate noise on bad phone lines, which can be disabled if the line is error-corrected.

Support: Poor to satisfactory. Remote 2 is sold without a warranty. Free technical support is provided for registered owners, Monday through Friday, from 9 a.m. to 6 p.m. Eastern time via a toll-free call. The technical support number was busy nine out of the 10 times we tried to call during a period of three days.

Value: Excellent. Remote 2 sells for $195 for the host and remote package, $129 for the host only or $89 for the remote only. We miss the capability to switch between data and voice, record sessions and originate calls from R2Host but are still impressed with the package.

Wang

CONTINUED FROM PAGE 43

ting its PCs to market, mail order may turn out to be a viable alternative channel for the company.

Stephen noted that the mail-order approach is probably better suited for buying software than hardware because of the rigors involved in shipping equipment by mail.

Despite the risks, companies such as Dell Computer Corp. in Austin, Texas, and many smaller PC vendors have managed to carve out a viable stake in the PC market using the 800-number technique, Stephen said. IDC statistics indicate that Dell sold 1.2% of the PCs shipped in the U.S. last year.

But while the PC market is growing, Wang's market share shriveled to 0.7% last year. That decline makes it that much more important for Wang to succeed with a mail-order strategy, Stephen said.

Wang officials said that the effort will soon be complemented by large-scale advertising and direct mail campaigns. They insisted that by standing out as the only major computer vendor in a world of mostly no-name and supportless mail-order houses, customers will be "compelled" to order Wang equipment.

But MIS managers warn that Wang will not succeed in a mail-order world by name recognition alone.

Brian Ellis, MIS director at bowling and billiards equipment maker Brunswick Corp. in Muskegon, Mich., said that he has mixed feelings about mail-ordering PC equipment.

"You get decent discounts but also a lot of broken promises," he said.

Ellis said that, in his experiences with mail orders, lack of inventory and late deliveries have disenchanted him from ordering by mail again. However, he said the merchandise usually arrives in good shape.

> "YOU GET decent discounts but also a lot of broken promises."
>
> BRIAN ELLIS
> BRUNSWICK

But while MIS managers may not feel altogether secure in ordering computer equipment by mail, IDC's numbers indicate that managers still continue to use mail ordering as an alternative to traditional distribution channels. According to IDC, PC mail orders now represent 5% of sales and are expected to grow.

Microsoft

CONTINUED FROM PAGE 43

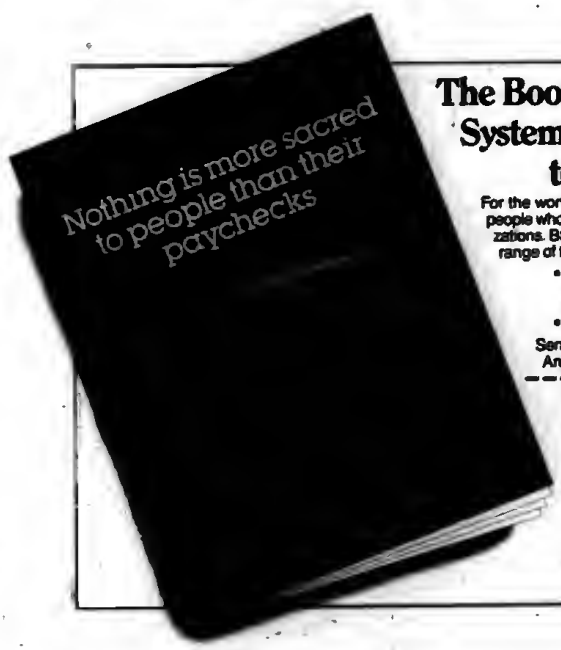
In fact, if it were not for Borland and its aggressive pricing, Microsoft would probably not be selling a $100 C compiler in the first place.

On the high end, Microsoft faces challenges from Rational Systems, Inc., with its incremental compiler approach and ability to tap memory beyond 640K bytes, and Waterloo Microsystems, which produces tight, fast code.

According to Microsoft officials, the new version of C was developed with the help of users groups across the country that tested the product and made suggestions even prior to its official beta-test cycle.

In addition to ease of use, QuickC 2.0 gains incremental compiling features that speed the edit to executable cycle; incorporates an improved ability to integrate assembly language into C; and includes support for more memory models, including small, medium, compact, large and huge.

According to the company, QuickC 2.0 runs on IBM and compatible personal computers and is currently available for $99.



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CASE tool facilitates Windows applications

BY WILLIAM BRANDEL
CW STAFF

Personal computer programmers writing for Microsoft Corp.'s increasingly popular Windows interface now have a tool to help surmount the development hurdle.

The graphical nature of Windows adds complexity to applications programming, a vexing situation for those used to character-based interfaces. CASE:W from Caseworks, Inc. in Atlanta, Ga., acts as a bridge, easing the transition of today's applications to the graphical environment.

The $1,495 CASE:W Version 1.0 helps generate code that is specific to the Windows environment. With CASE:W, programmers still write the code for the core functions of an application; after that, the Caseworks tool generates code to create menus, windows and dialog boxes and to provide memory management. This has been the most difficult portion for many programmers used to older, character-oriented environments.

The product is created from Windows code sets and production rules and includes a complete programming environment that generates concise, pre-tested code, officials said.

It also includes a front-end prototyper that gives the user a way to describe the application program's windows and controls. The prototype window program specifies for the user the essential characteristics for the program's main window and menu system. CASE:W then automatically generates the program code files and produces the files necessary to develop the remainder of the program.

Other features

CASE:W reportedly supports many of the Windows controls such as menu bars, pop-up menus and dialog boxes. The product's design modes can extend to interface with dialog boxes not linked by the program's menu system. CASE:W also generates the Windows routines to process the dialog boxes.

CASE:W runs on Intel Corp. 80286- or 80386-based machines with at least 640K bytes of memory. A hard disk drive is highly recommended.

It also requires the Microsoft Windows Software Development Kit, C Compiler Versions 5.0 or higher, Make Utility and Linker and a text editor compatible with DOS or Windows.

Patents

FROM PAGE 43

Last year, the PTO decided to explore whether CD-ROM technology could act as a substitute for some portions of CASSIS and reduce CASSIS on-line costs. During a period of several months, 10 patent libraries field-tested computer hardware and a CD-ROM disk containing a five million-record CASSIS database, the full text of the 120,000 titles in the U.S. Patent Classification Manual and a file of approximately 100,000 corporations holding patents.

The test disks were mastered by Dataware Technologies, Inc., a Cambridge, Mass.-based developer of authoring and retrieval software for use with CD-ROM applications and services for CD-ROM publishers.

Within three months, the test sites saved more than $175,000 on their on-line costs, strongly suggesting that the CD-ROM information retrieval service could entirely replace the present on-line system, Lawson said.

With the successful completion of the test program at the 10 patent libraries, the PTO now plans to install CD-ROM systems in all of its libraries by the end of the year, Lawson said. The government office also intends to issue two other test disks with customized development and text-retrieval software and then begin regularly updating the disks and publishing them every two months.

More than money

Beyond the dollar savings, projected to be $300,000 per year beginning in 1989, the CD-ROM information retrieval programs will permit the PTO to resume expanding its network of patent libraries at a relatively low fixed cost and to open libraries in areas of the country that are not well-served, including 10 states that do not have patent libraries, Lawson said.

The PTO will use Dataware Technologies' CD Author, a development system, and CD Answer to retrieve, manage and produce information from CD-ROM disks.

The software runs on an IBM Personal Computer AT or compatible with 512M bytes of random-access memory and a 20M-byte hard disk drive running Microsoft Corp.'a MS-DOS 3.0 or higher. Dataware Technologies, however, recommends that it be run on an Intel Corp. 80386-based machine with as much as 4M bytes of RAM and a hard disk with four times the capacity of the expected database volume.

Barney

FROM PAGE 43

Esber has cast a dark cloud over Frank'a decision to take on the database management system giant. Not only did Esber sue Fox Software — a company he almost bought — for copyright infringement, but he has made threats against other Dbase-like products, including, by definition, little ol' 1 Plus.

We asked Esber if there was a mechanism by which a little guy like Rogers could submit a product to Ashton-Tate to find out if it infringes on Tate'a still untested copyrights. Sorry, Esber said. He'a on his own.

Rogers is undeterred. He is working on a new version with a hot new menu system that is quite different from Dbase. But he now faces a new dilemma. If Rogers fades away, Ashton-Tate can prove no damages and likely won't sue. If he becomes successful, then Ashton-Tate may bring in the lawyers. Of course, healthy sales would constitute a healthy defense fund.

A PC is just a phone call away. There is plenty of zirconia and polyester being hawked on the Home Shopping Network cable television show. But there is also an odd array of obsolete and liquidated PCs up for grabs. The Wang Office Assistant — a machine that offered everything a PC should offer except compatibility — has shown up, along with old Xerox PCs and an assortment of NEC and Epson laptops with tiny LCD displays designed to ruin the best of eyes. In short, you know the machine is a dud when you can buy it on TV.

Therefore, it should come as no surprise to see the IBM PC Convertible laptop on sale. At first blush, though, the price was a shocker. A tag of $998.77 with a printer, battery pack and 512K bytes of random-access memory was pretty tempting for this dual-floppy dog that the show said lists for $2,129. In fact, it was so tempting that 660 were sold in about 15 minutes. With the help of that pretty Home Shopping Network lass fingering the memory card, IBM probably doubled its entire Convertible sales in those 15 minutes.

But on closer inspection, this price really isn't so hot. After all, the Convertible has more than a few canine qualities, and it is clear that IBM is fire-saling these babies. In fact, the original machine with 256K bytes now lists for a paltry $500, and that printer goes for a mere $142. So $1,000 is more than a bit steep. If the Home Shopping Network would only offer real bargains and start selling ATs!

Sorry, Mort — you're wrong. Corporate Software founder Mort Rosenthal makes a nice living selling software and support to Fortune 1,000 firms and seems to understand user concerns pretty well. But there is one point Mort has made that rubs against the grain of what *Computerworld* and MIS are all about.

In a recent column in these pages that otherwise was completely on the money, Mort pleaded with the user community not to become the technology gurus but instead to rely on analysts, vendors and resellers to unearth the secrets of future technology. That'a plain silly. Resellers care about money, vendors too often develop products in a vacuum and analysts often astound the world with their lack of insight. On the other hand, MIS actually uses the technology and knows better than any other group what the future should be.

Barney is a *Computerworld* senior editor, microcomputing.

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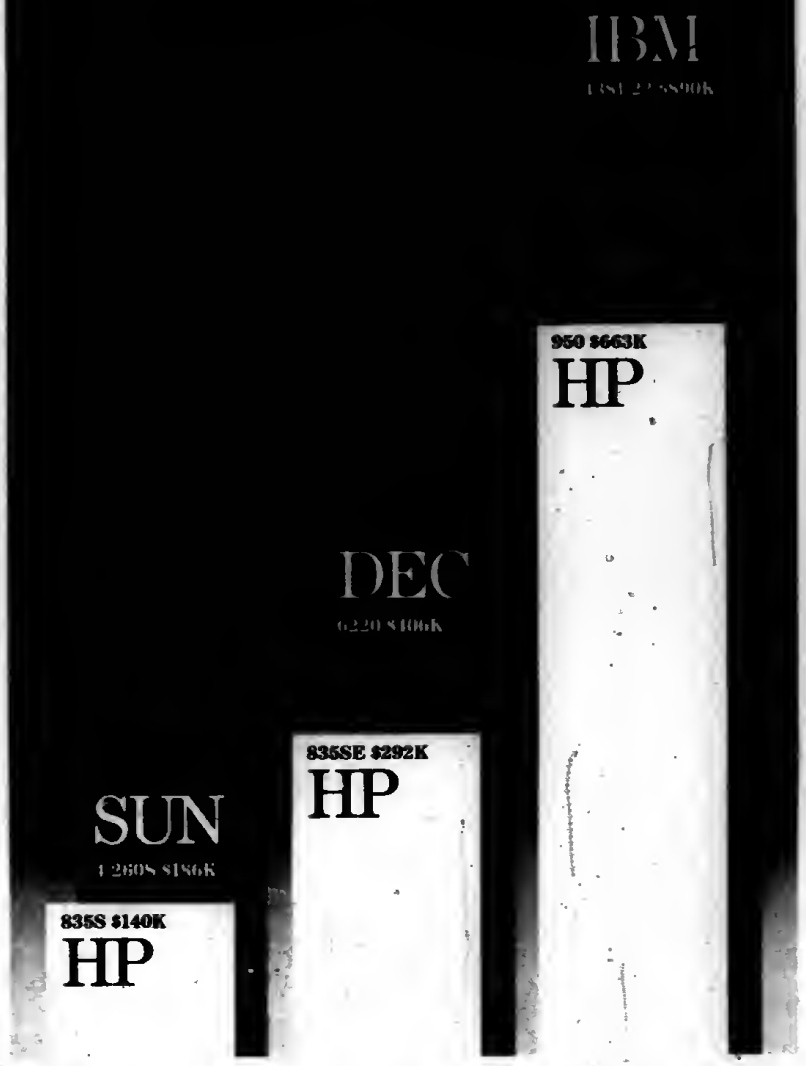
You wouldn't believe what computer systems cost these days.



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Note: The cost-of-ownership figures reflect the initial purchase price and 5-year hardware and software support costs for servers configured with operating systems, memory, mass storage and terminal connections. Prices as of October 1, 1988.

*Based on averaging six categories: Maintenance Effectiveness, Maintenance Responsiveness, Troubleshooting, Documentation, Education and Software Support.

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DATA STREAM

Clare Fleig

A little too careful?

In the wake of the Internet virus plague, information systems managers are rushing to improve network security, and vendors are in an equal hurry to provide new and more sophisticated tools for doing so. This could lead to trouble, because while everyone is concentrating on plugging leaks, they may neglect to balance the need for security against the user's need for information and productivity levels.

In situations like the Arpanet attack, companies and MIS managers in charge of communications often respond like the farmer whose horse was stolen — by locking the barn door after the thief had struck — with security reviews and added precautions. But in their haste to guard against trouble, IS departments can create such a maze of security that it discourages users from taking advantage of the network.

If users are faced with numerous barriers to access and numerous passwords to memorize, they may respond by simply not using the network, defeating its raison d'etre. This is particularly true of casual users who do not have a pressing need to access network resources and top executives who are only too ready to delegate onerous

Continued on page 52

Joint effort opens E-mail door

Aerospace group prods service providers into supporting X.400 link

BY PATRICIA KEEFE
CW STAFF

WASHINGTON, D.C. — A pressing need to communicate electronically with business partners at a reasonable cost is what prompted one trade association's successful bid to get a prominent group of electronic mail providers to agree to support gateways to competitive mail services.

The Aerospace Industry Association (AIA) recently met with eight such service providers to hammer out interconnection requirements for participation in an AIA pilot network slated to kick off Feb. 1.

The AIA is a trade organization representing manufacturers of commercial, military and business aircraft and related equipment and components.

The pilot will involve a select number of AIA members including Hughes Aircraft, Boeing Co. and Northrup Corp. The test will be set up so that each user is connected to a different mail system, with some attached to more than one service.

Initially, the pilot will focus strictly on enabling AIA members to send messages — as opposed to electronic data interchange documents — to each other and outside trading partners via private and commercial E-mail systems, according to Peter Donaghy, who represented Hughes Aircraft Co.

The way to go

"Without interconnection, this process is difficult and may require subscription to multiple mail services," said Joseph Dauksyscq, AIA's associate director, operations service. This is precisely what many AIA members are forced to do today and what they hope to avoid in the future.

Instead, AIA is asking its messaging suppliers to use the CCITT X.400 standard for interconnection and to provide gateways between proprietary mail systems to X.400 as well as security and quality of service parameters.

That will do

"We are not mandating that they all hook to every other service — just that they support X.400 in the same manner, which will provide the appropriate level of interoperability," Donaghy explained. "We asked if they could have this capability in place by Feb. 1, and none of them balked."

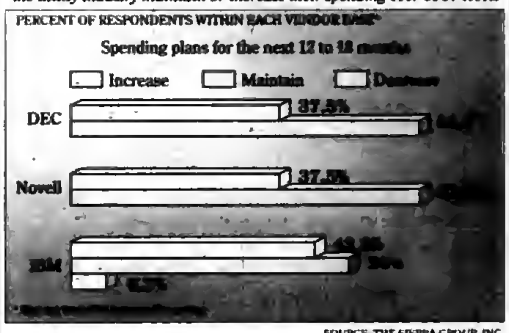
Participating service providers included IBM's Information Network, GE Information Services, AT&T, Western Union Corp., Dialcom, MCI Communications Corp., McDonnell Douglas Computer Systems Co.'s Tymnet and Telenet Communications Corp. Two other suppliers were invited to participate but declined.

These suppliers were chosen because they are the ones currently serving AIA members.

Data View

LANs in power

Through 1989, dominant LAN suppliers should see their customers in the utility industry maintain or increase their spending over 1987 levels



SOURCE: THE SIERRA GROUP, INC.
CW CHART: JOHN YORK

ISDN still rolling at full steam

BY PATRICIA KEEFE
and ELISABETH HORWITT
CW STAFF

Often derided as an acronym for "I Still Don't Know," the market for ISDN, or Integrated Services Digital Network, picked up a head of steam in 1988, and that momentum has continued into the new year with a spate of announcements and reports.

AT&T recently announced what company spokeswoman Daisy Ottman described as "yet another ISDN building block:" a Clear-Channel Capability that allows customers to use the full 64K bit/sec. bandwidth within each of the 24 data channels in its Accunet T1.5 service. This paves the way for links between Accunet and ISDN services, since ISDN B channels also carry clear 64K bit/sec. bandwidth.

Currently, however, the main benefit of Clear-Channel Capability is increased utilization of available T1 bandwidth, Ottman said. Currently, AT&T provides no link between Accunet T1.5 and international or domes-

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NCR Comten launches SNA salvo

BY ELISABETH HORWITT
CW STAFF

ST. PAUL, Minn. — NCR Comten, Inc. has released yet another product salvo against IBM in its ongoing battle for market share in the Systems Network Architecture front-end processor arena.

The NCR Corp. subsidiary announced upgrades that are said to provide the Comten 5660 with more power and greater backup flexibility than a comparable configuration of IBM's high-end communications processor, the 3745.

The new High Performance Feature is said to provide Comten 5660s with 50% more throughput, in terms of transactions per second, than comparably configured 5660 models without the enhancement. Comten 5660s equipped with the feature have 80% more throughput than a comparably configured 3745 Model 210, according to a Comten benchmark test.

The Model 210 is IBM's single-processor version; Comten gave no comparison with IBM's dual-processor 3745 models.

The feature is priced at $60,000 for new systems and $75,000 for an upgrade. Comten also announced that it was cutting the 5660's base price from $300,000 to $175,000.

The High Performance Feature allowed Donovan Data Systems, Inc. in New York to increase throughput, connect more lines and add more applications without having to add another front-end processor — which would be expensive both in terms of hardware and support dollars, according to Ronald Block, database service vice-president. Since the enhancement was added last summer, Donovan Data has 50% instead of 90% utilization of its Comten 5660, he said.

Continued on page 52

Big guys help Apollo boost NCS as standard

BY ELISABETH HORWITT
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. has been steadily gaining ground in its efforts to make Network Computing System (NCS) an industry standard. Last May, the workstation vendor proposed NCS as part of the Open Software Foundation's (OSF) planned open software environment.

Since then, IBM, Hewlett-Packard Co. and, most recently, Digital Equipment Corp. have licensed the software from Apollo.

Software tools within NCS allow the user to "take a single application program, split it up, and have the parts executed on different machines, then brought back together," DEC spokesman Peter Kobs said. Different segments of an application can communicate or trade data via remote procedure calls.

One of the features that differentiates the product from its competitors is a "location broker" residing on one system that keeps track of the location of various software and data elements, according to Apollo senior product manager Saul Marcus.

DEC has not committed itself to definite product plans for NCS. However, "I don't think DEC has any choice" about incorporating NCS into its Ultrix systems, said Bruce Richardson, vice-president at Advanced Manufacturing Research, Inc. in Cambridge, Mass. Given that the Unix environment is "inher-

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Inside

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- Thin-wire twisted-pair adapter available from Cabletron. Page 58.

Fleig

CONTINUED FROM PAGE 51

tasks to subordinates.

Thus, we have the need for a balance between security and accessibility. "You obviously can't allow every user to have free run of the system, but at the same time, you want a network that users feel comfortable with," says a DP manager at a San Francisco-based travel agency.

Achieving that balance involves weighing a number of factors, including the size of the organization, the sensitivity of the data on the network, the sophistication of the user community and the number and types of networks and users on each system.

It also requires taking a whole new look at security and how it is handled in the organization. All too often, security measures are focused on the network itself, through the use of file- and system-locking on the server as well as a suite of passwords.

But the physical network is only one component of security. Two other key factors often overlooked are the corporate security policy and educating the user community.

"A comprehensive security policy issued from the top can have a big effect on the use of the network," says the MIS director of a Chicago-based insurance agency. "If users down the line see executives employing backup security — whether it is for copying a disk or for a network — they're more willing to listen."

The creation of a comprehensive security plan starts with the MIS department. The first step involves resolving conflicts between servicing user needs and protecting the information base. The goal is a policy that achieves the maximum in user productivity while effectively protecting that information base.

Next, MIS should develop a plan to handle day-to-day access operations as well as special circumstances such as planned break-ins, curious hackers and user access to the network from nontypical remote sites.

When the policy is drafted, it should be reviewed and then disseminated from top management, so that it is given more weight by network users.

Ideally, the security procedures should cover all company DP operations, including the use and copying of floppy disks, desktop computer use and network operations.

Goes hand in hand

A published security policy goes hand in hand with an education policy that familiarizes users with the need for security. "When users understand why we need certain levels of security, they are more willing to adapt to it," says the Chicago MIS director. He also notes that the publicity surrounding visible computer virus attacks can be advantageous in reminding users about the importance of secure networks.

Designing a security policy also means facing one indisputable fact: No network, regardless of the security precautions taken, will ever be fully secure. Any program that a person can devise, another person can eventually crack. Given that axiom, the best defense MIS managers have at their disposal is a three-pronged approach: a formal security policy that takes into account the individual trade-offs between security and network usage, an educated and informed user base and a secure physical network installation.

Fleig is director of systems research specializing in local-area networking and IBM communications for International Technology Group in Los Altos, Calif.

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NCR Comten

CONTINUED FROM PAGE 51

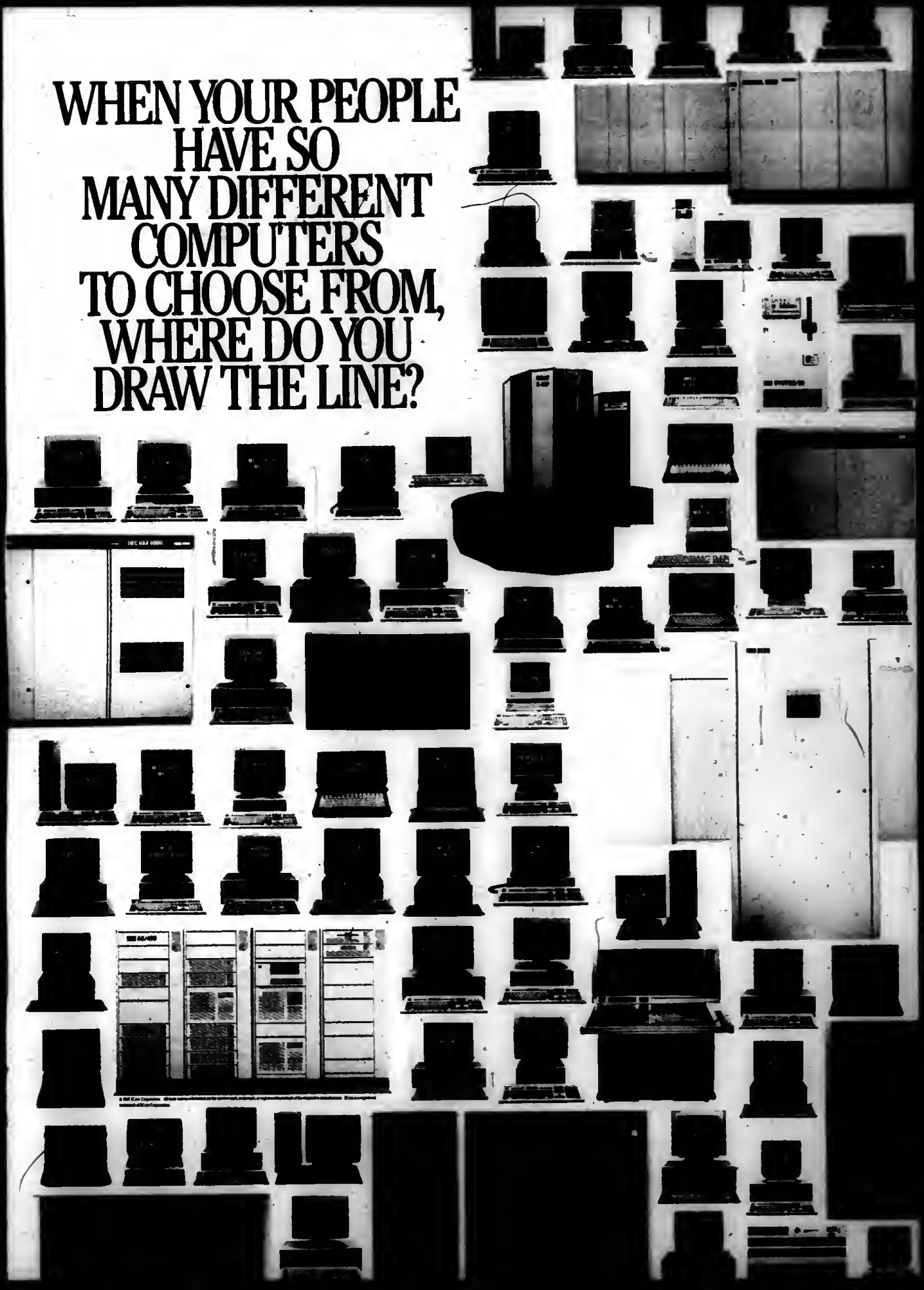
Comten also announced a new version of the Universal Communications Adapter (UCA), which reportedly provides more flexibility than older models in terms of backup and data-routing configurations. The UCA acts as a multiplexer for the 5660, handling incoming lines from modems, protocol converters and other communications devices. While the older adapter could only interface with one primary processor and one backup system, the new model can handle up to two backup systems and two active systems, Comten said.

Unlike IBM's backup system, which uses a second CPU for full redundancy, Comten's UCA allows the user to choose whether to have partial or full redundancy of processors and adapters, according to Comten Vice-President of Development Rolf Groenke. The product is scheduled for delivery in the second quarter, with prices beginning at $21,000.

Comten's recent surge of enhancements, which have included an IBM Token-Ring interface, are necessary if it wants to combat IBM successfully at the high end of the communications processor market, said Josh Gonze, a consultant at market research firm International Data Corp. in Framingham, Mass. "Comten has taken its top of the line and switched in more powerful components, which is the way upgrades should be done," he said.

A third Comten announcement, the 16-Line Communications Base, is said to handle up to eight 56K bit/sec. lines, compared with the older board's four-line limit. Second-quarter delivery is planned at a base price of $7,035, according to the vendor.

WHEN YOUR PEOPLE HAVE SO MANY DIFFERENT COMPUTERS TO CHOOSE FROM, WHERE DO YOU DRAW THE LINE?



ISDN

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tic ISDN services. It does, however, provide an ISDN gateway to Accunet Switched Digital Service, which handles 64K bit/sec.

Clear Channel Capability is provided as an upgrade to the AT&T network and is available free of charge with new orders for interoffice channels on Accunet T1.5, according to AT&T.

Chip maker Advanced Micro Devices, Inc. in Sunnyvale, Calif., has both reduced the price on its Am79C30A Digital Subscriber Controller, which is reportedly a highly integrated chip for ISDN terminals, and shipped the Amlink3, an ISDN software development kit that costs $40,000.

Ongoing technology and yield improvements have sliced $5 off the chip price, which now lists at $24.50. The impact on end users is the fact that ISDN equipment and service costs will decline as component expenses are reduced, making them competitive with existing analog and non-ISDN digital offerings.

Compaq Computer Corp.'s former subsidiary Telecompaq is said to be rising again as an ISDN software house. Advanced Connectivity Systems, Inc. in Richardson, Texas, which reportedly was founded by refugees from Compaq's now-defunct division, is said to be readying an ISDN-based personal computer software package that will combine electronic mail and voice connectivity features originally developed by Telecompaq, an ISDN user claimed. Release is scheduled for the first quarter of this year.

Another ISDN consulting service has emerged, this time from CAP International, Inc. in Norwell, Mass., which has launched the ISDN Architect Strategic Planning Service for integrated networks. The service will focus on market forces, deployment and consumption issues, as well as worldwide ISDN trends. It will also address standards, regulatory impacts, competitive stances and consumer adoption criteria.

Users seeking more information about ISDN can peruse either of two reports published by Information Gatekeepers, Inc. in Boston.

The first is a report initially prepared for the National Aeronautics and Space Administration by the University of Colorado Center for Space and Geosciences policy. "NASA and the Challeges of ISDN: The Role of Satellites in an ISDN World" is now available through Information Gatekeepers for $75.

The study outlines ISDN concepts and lists key organizations, the current status of key standard recommendations and domestic and international ISDN implementation progress. It also suggests that "NASA could work with other space agencies to ensure a coherent posture with regard to the role of satellites in ISDN."

A second effort, "ISDN Applications," lists and describes more than 70 applications, including some taken from field trials and actual applications used by Southwestern Bell Corp., AT&T, GTE Communications Systems, Ameritech, Bell Canada and US West.

The tome includes about 30 applications identified by the national ISDN Users Forum, which, coincidentally, is meeting tomorrow through Thursday in Gaithersburg, Md.

Apollo

CONTINUED FROM PAGE 51

ently multivendor, if DEC wants to be considered on par with Apollo, Sun and other Unix workstations, it needs to incorporate leading server technologies," he added.

"A lot of users won't take VAX seriously as a [Unix] server because it is too much of a DEC solution," Richardson said. While Ultrix systems can exchange files with other types of workstations via Open Systems Interconnect or Transmission Control Protocol/Internet Protocol, they currently have no way to share applications, he added.

While DEC does offer distributed processing on its systems, NCS "is a horse of a different color," Kobs said. DEC, he added, has "symmetrical multiprocessing on a single system" and some job-sharing on Vaxclusters, but it lacks the distributed functionality offered by NCS.

Backing by leading computer vendors should help NCS win acceptance into the OSF environment, Richardson said. Particularly significant are IBM's plans to integrate NCS into its Unix-like AIX operating system, because AIX is already slated to be part of the open software environment.

Is it enough?

Still in question, however, is whether NCS' growing stature as an industry standard will help Apollo catch up with archrival Sun Microsystems, Inc. in the workstation market, Richardson said.

Sun has not produced a successful competitor to NCS in the distributed applications arena. However, Sun's Network File System (NFS), supported by dozens of vendors, has been hailed as an industry standard for several years.

Last week, Symbolics, Inc. announced Symbolics-NFS, its own version of Sun's protocol, which will allow Symbolics' artificial intelligence workstations to communicate with a wide variety of workstations and operating systems, the vendor said.

Symbolics-NFS is priced at $1,000. Both products are available now for the Symbolics 3600 family of workstations.

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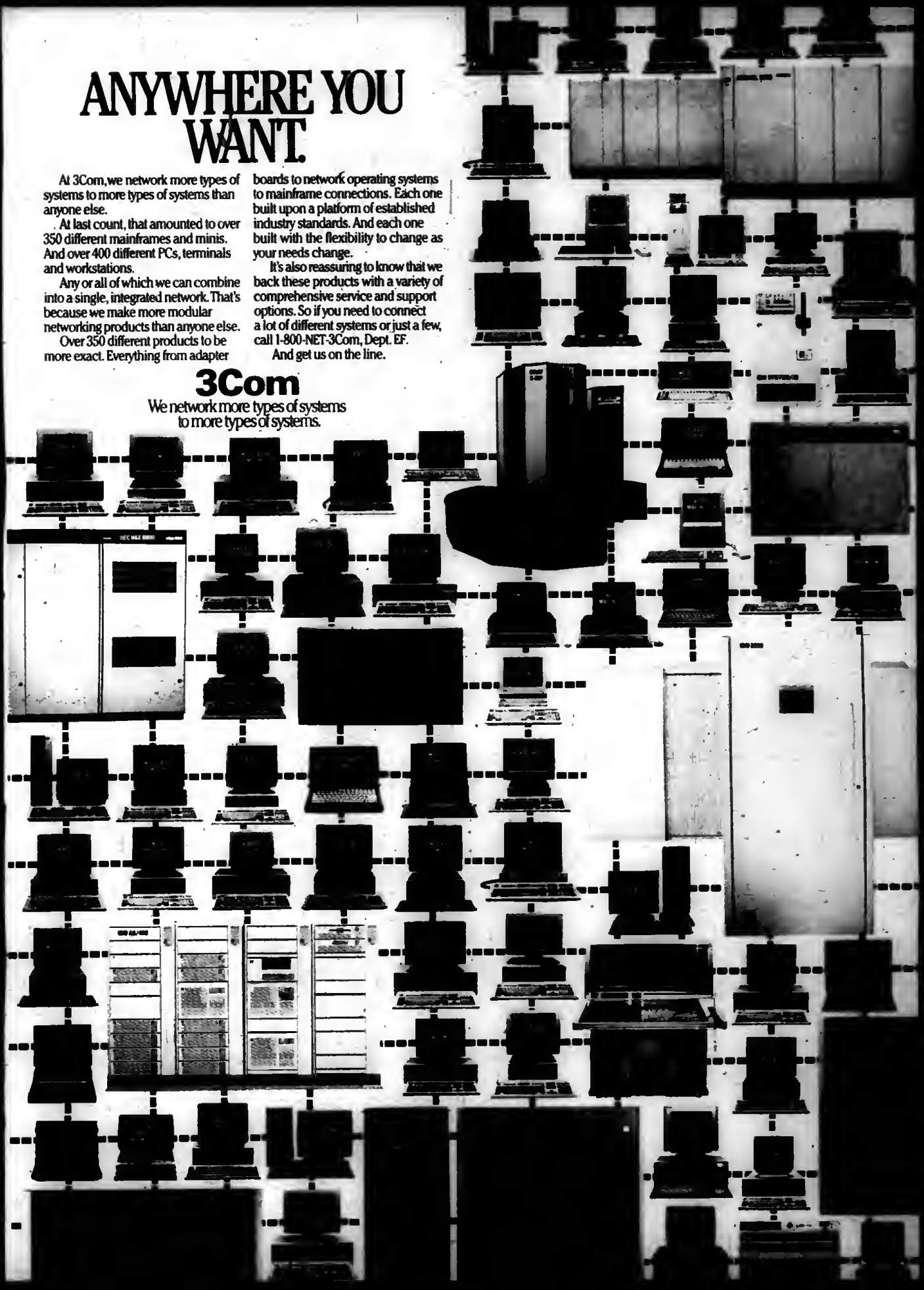
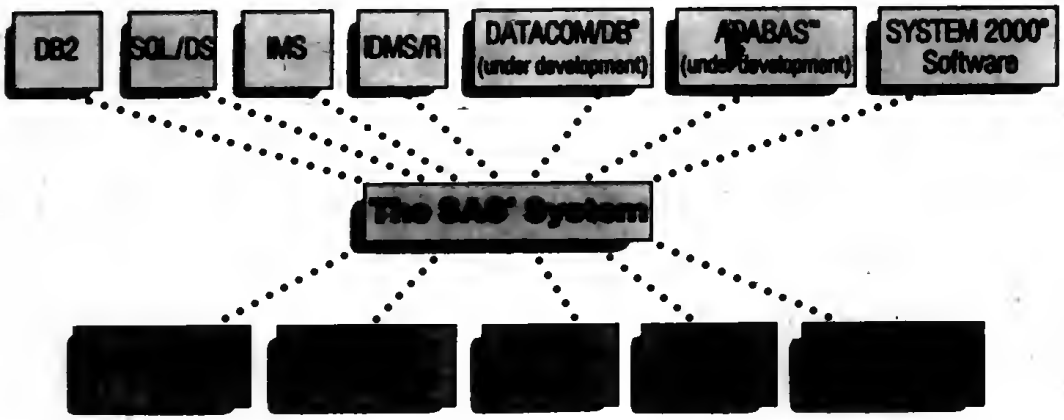


Get the Facts from Your DBMS.



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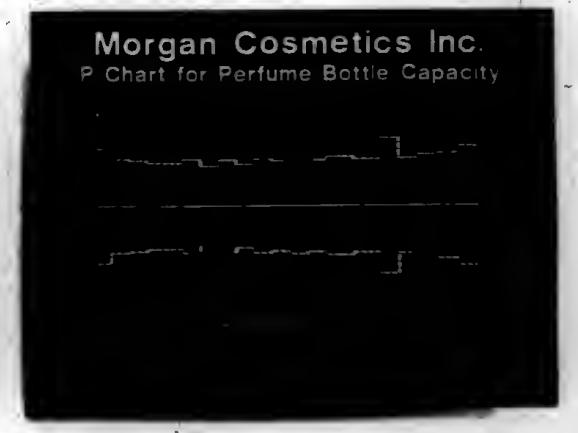

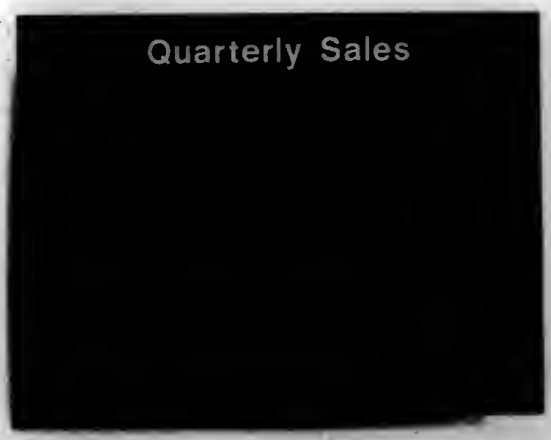

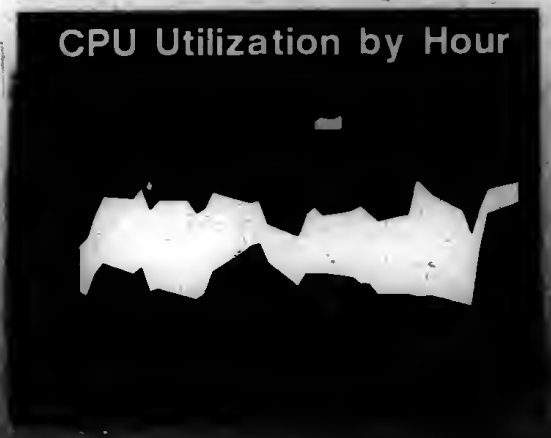

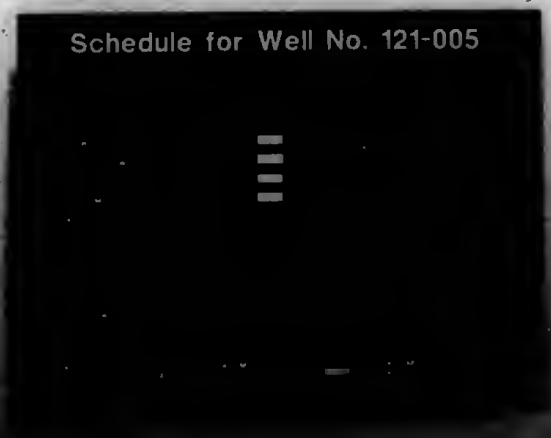

NEW PRODUCTS

Local-area networking hardware

A high-speed data communications controller has been introduced by **Computer Modules, Inc.**

Designated the **LSPC Serial/2**, the unit is reported to be a dual-channel, multiprotocol, asynchronous/synchronous serial interface designed for the IBM Personal Computer AT bus. The controller has a maximum data rate of 400K bit/sec. and incorporates a 3-byte receive buffer on each channel.

The LSPC Serial/2 costs $245.

Computer Modules, 2348C Walsh Ave., Santa Clara, Calif. 95051. 408-496-1881.

Cabletron Systems, Inc. has announced an **Extended Media Adapter** designed for integrating installed thin-wire devices and network segments into twisted-pair Ethernet local-area networks.

According to the vendor, the product allows users of personal computer LANs, Digital Equipment Corp. workstations and other devices with Ethernet ports to utilize the star topology, wire management and centralized network control offered by twisted-pair LANs.

The Extended Media Adapter costs $550.

Cabletron, P.O. Box 6257, Rochester, N.H. 03867. 603-332-9400.

Local-area networking software

Knowledge Network Systems, Inc. (KNS) has announced an office automation platform for Novell, Inc.'s personal computer local-area networks.

Called **Oasis**, the system reportedly protects against several types of security breaches, including computer viruses, by providing a controlled environment at the corporate management level. It also includes an interpretive language facility for application development.

Oasis is priced at $2,995 per server. The number of workstations that can be incorporated is determined by the type of LAN.

KNS, Suite 1800, 3800 Concord Pkwy., Chantilly, Va. 22021. 703-968-0378.

Kortek, Inc. has introduced a remote communications software package with Microcom Networking Protocol error-checking features for the IBM Personal Computer and Personal System/2 market.

Called **Freeway Remote**, the software offers a debugger and programmable keyboard control functions. Other features include a voice-to-data switch and a graphics support file.

Freeway Remote costs $249.95.

Kortek, Suite 302, 460 California Ave., Palo Alto, Calif. 94306. 415-327-4555.

Modems/Multiplexers

Best Data Products, Inc. has entered the Apple Computer, Inc. marketplace with the introduction of the **Smart One 2400XMAC** external modem.

The Macintosh-compatible device offers data transmission rates at 2,400 bit/sec. and includes autoanswer and autodial capabilities, the vendor said. It is priced at $279.

Best Data, 5907 Noble Ave., Van Nuys, Calif. 91411. 818-786-2884.

Halley Systems, Inc. has introduced a T1 broadband modem developed for high-speed data links.

The **Z2000** reportedly provides protocol-transparent, serial data transfers at the T1 rate and is said to be ideal for any application that requires high-speed point-to-point data transmission, including workstation-to-mainframe and private branch exchange links.

The Z2000 costs $3,950.

Halley Systems, 281 Orchard Pkwy., San Jose, Calif. 95134. 408-434-3500.

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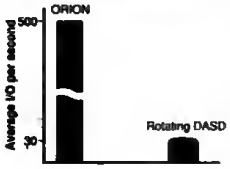

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CORPORATE ELECTRONIC PUBLISHING

New thrust brings CEP closer to MIS

BY LARRY STEVENS

DEBORAH WITHEY

Bonnie Whidden is willing to defer to MIS, but only up to a point. Whidden, a graphics and administrative services manager at Kawasaki Motors Corp. U.S.A. in Irvine, Calif., reports to information services and was, in fact, a data processing staff member before shifting into her current post. However, she prefers to think of the MIS role in her department's electronic publishing operations as an advisory, rather than a supervisory, one.

"MIS acts as a consultant for us," Whidden says. "They are part of a research committee and implementation committee. They have their expertise, we have ours, and other areas of the corporation such as marketing also need to have input."

Robert Shepard, vice-president of information services, basically agrees with that assessment. His primary concern, he says, is to make sure that the corporate electronic publishing (CEP) department fits in with the rest of the organization.

"There is a real productivity gain if the text and graphics files created by the various user departments can be transferred either via network or through disk to the CEP area," he explains.

Although Shepard says he does not make the final decision about what hardware and software equipment the CEP department should buy, he does examine purchase requests to make sure the equipment is compatible with what other users are working on.

"We're looking for something that is good for the entire organization vs. people making individual decisions," he says.

So far, that mission has not conflicted with the interests of the electronic publishing operation. "Everything they've requested has fit into our compatibility requirements," Shepard says.

Unfortunately, that degree of agreement is somewhat rare in this uncertain period, when MIS organizations are only starting to figure out what their responsibilities should be in relation to expanding corporate electronic publishing operations.

Through the back door

Like personal computers in the early 1980s, corporate electronic publishing equipment has often arrived in corporations through the back door — with departmental funds and without MIS involvement. For a long time, the impact of these systems was minimal and could be safely ignored.

Now however, corporate electronic publishing is evolving into an enterprisewide activity and being accorded strategic importance.

"It's a $3 billion business this year that has grown from almost zero a few years ago," says Vera Allen-Smith, an industry analyst at market research firm Dataquest, Inc. in San Jose, Calif. "Companies are taking seriously the concept of the competitive document that says that if the content of my document and your document are the same, but mine looks better, I win."

As a result, MIS has virtually no choice but to become involved at some level.

"MIS is being pulled into corporate electronic publishing reluctantly, just as they were pulled into the PC arena," says Virginia Campbell, director of the electronic publishing center at the Dallas Infomart.

MIS managers are not necessarily anxious to get involved with publishing activities, Campbell says, but they also are not about to make the same mistake they made with PCs — letting the technology grow wild and without standards. "They don't want that to happen to them again. So they're asking questions," she says.

Different questions

Not surprisingly, the questions that MIS managers ask are not the same questions that graphics and publishing people ask, according to Campbell. "MIS wants to know about security, file management and power," she says, "It's important information and things that the graphics people don't ask about. I think there could be a good marriage between the two as long as jealousies don't get in the way."

Whether it is jealousy or just different points of view, the relationship between MIS and electronic publishing can get off to a rocky start.

At GTE Corp. in Thousand Oaks, Calif., for example, Mel Taylor, supervisor of composition, says MIS' control of a new system purchased two years ago nearly produced a disaster.

"It was MIS' job then to assimilate our wish list, research the type of equipment that would best satisfy our needs and make recommendations to management," Taylor recalls. But, he adds, "They didn't do a very good job of it. This is not to denigrate them, but it's just that they were used to looking at different things than we were."

According to Taylor, MIS ignored most of the composition issues that he considered important and concentrated instead on information such as the number of pages (200,000) the department would have to process each

Stevens is a free-lance writer based in Springfield, Mass.

INSIDE

Product Face-off
IBM, Xerox take different approaches with IC/Ps. Page 63.

A Mixed Bag
How to manage mixed-platform publishing. Page 64.

Converging Paths
Merger predicted between CEP and image processing. Page 66.

New thrust

FROM PREVIOUS PAGE

year. Using hard numbers as a guide, MIS determined the best system that could meet the requirements considering cost, efficiency, speed and capacity.

Although MIS did an excellent job of meeting its own parameters, Taylor says it downplayed issues such as the number and types of fonts, the ability to kern or manipulate line endings and output to a typesetter equipment. "The system it proposed wouldn't even do the same job that the system it was replacing did," Taylor says.

Taylor's requirements were taken into account after further negotiations; now, he says, relations with MIS are good.

But then again, the MIS department does not have the authority that it originally had. "MIS advises us and helps us. But we have the final decision," Taylor claims.

That situation highlights a problem of growing urgency. As CEP becomes a more important part of the firm, it is not really clear in many organizations who controls the system.

Herman Prescott, vice-president of SEI Information Services, an Atlanta-based consulting firm that helps set up CEP operations, says that the real difficulty is that everyone feels entitled to some input. "Everyone — MIS, marketing, public relations — feels that they should have a say," he notes.

Certainly MIS' claim is neither entirely clear nor well-established in most organizations.

Many firms start with PC-based electronic publishing systems and then graduate to workstations tied to minicomputers or mainframes. Some of these systems are later connected to other users or the corporate mainframe through a network.

As a system grows, and as networking and corporate standards become necessary, MIS involvement may also grow. The extent of that involvement differs greatly from organization to organization.

"A lot of companies are now at the point where they are trying to standardize both the forms that their publishing departments will create and the software — such as spreadsheet or word processing or page layout — that users throughout the corporation use to create those forms," Dataquest's Allen-Smith says. "Standardization will eventually make possible the kind of connectivity that MIS is used to and that will require more MIS involvement."

> "CARS ARE full of computers these days, but you wouldn't have MIS select the corporate fleet."
>
> FRANK ROMANO
> *TYPEWORLD*

Many electronic publishing managers are willing to accept MIS assistance in those areas in which their activities intersect with other parts of the corporation. However, most strongly resist the idea of overall supervision from MIS or encroachment from that quarter into the day-to-day operations of publishing units.

Even at Kawasaki, where the ties between MIS and corporate electronic publishing are stronger and more direct than ordinary, it is not quite clear what might happen if the relationship were tested by the kind of conflict that occurred at GTE.

"So far, we haven't had to make any sacrifices, since everything CEP requested did fit into our compatibility requirements," Shepard says. "But if necessary, we would veto equipment if it didn't fit in."

Even if Whidden, who comes from a data processing background, were inclined to be more compliant, GTE's Taylor is more typical of publishing managers in general. He comes from a graphics, rather than a technical, background.

Taylor's technical sophistication has grown as his department has grown, and one of his major responsibilities now is systems management. His department is responsible for producing 8,000 different forms, plus display ads, invoice stuffers, public relations material and proposals.

Such on-the-job learning is possible, explains Frank Romano, editor of *Typeworld*, a Salem, N.H.-based publication for users of electronic publishing systems, because vendors recognize the technical limitations of corporate publishing staffs and have emphasized ease of use and ease of maintenance in their designs.

In many organizations, corporate electronic publishing grew out of a nonelectronic counterpart, in which people who may have been hired to run typesetter equipment or even do proofreading are now called on to maintain a computer system.

Kawasaki's Shepard

Jim Gayan's operation at North Carolina State University in Raleigh is a typical example of just how far publishing managers are willing to let MIS into their operations.

Gayan is the service section supervisor in a department that prepares camera-ready copy for all pamphlets published by the North Carolina Agricultural Extension Service. He uses the university's MIS department for consultation and direction, but for day-to-day operations, he has a system manager who was formerly a journalist.

"If you're working in electronic publishing, you have to know electronics," he says. "For us, a journalist is no longer someone who hunts and pecks on a typewriter; he has to understand computers."

Romano says that there are two ways MIS typically gets involved in CEP. Only one way, however, is right. He says, "If MIS gets to choose or control the equipment simply because it has computers in it, that's wrong. Cars are full of computers these days, but you wouldn't have MIS select the corporate fleet. Electronic publishing is more involved with publishing than electronics. The right way is for MIS to help coordinate the publishing department with other areas of the corporation and to help with networking."

That is, in fact, the point at which most MIS involvement seems to be concentrating at the moment.

Gayan, for example, is now working closely with MIS for the next phase of his operation, which is to link all the offices at the university that send him data through a LAN. "But," he says, "we put the twisted-pair cabling in place mostly by ourselves. This is primarily our project, and we are learning how to do it."

At Acurex Corp. in Mountain View, Calif., Sarah Paralo runs a 22-person CEP operation that supports all four of Acurex' major divisions — aerospace systems and equipment; aircraft galley refrigeration equipment; the data acquisition, measurement and control division; and the environmental division. Her story is a similar one of day-to-day independence and selective alliances with MIS.

The department's current systems adminstrator, who was

Put to good use

Departments in a typical Fortune 500 company use corporate electronic publishing for a range of projects

• Company newsletters • Policies • Benefit descriptions • Recruiting brochures • Forms • Leave of absence requests • Vacation requests • Expense reports	• Forms • Annual reports • Quarterly reports • 10K forms • Internal financial reports • Presentations • Investor relation collateral	• Price lists • Contracts • Distributor policies and procedures • Proposals
• Product specifications • Users guides	• Illustrated assembly instructions • Purchase requisitions	• Sales force training materials • Product brochures • Point-of-sale materials

SOURCE: DATAQUEST, INC.

Publishing centralization isn't a solution for everyone

While the trend in many companies is for corporate electronic publishing departments — usually through MIS — to create closer links to other areas of the organization, some firms are moving in the opposite direction.

Especially in companies in which the publishing unit has not been able to provide adequate services for the user community, some departments are taking it upon themselves to create miniature corporate electronic publishing operations that are reminiscent of the distributed data processing movement.

One such example is at the Cambridge, Mass.-based Automation Applications Division of the U.S. Department of Transportation. According to Project Engineer Richard D. Wright, his organization does have a publishing department — although it is not electronic — that had produced most of the publications that his division submitted. But a problem arose when Wright found himself with a two-month deadline on a 1,500-page document for the Federal Aviation Administration.

"If we send it to the [corporate] publishing department, we have to get in line behind whoever got there first, and then when we got the project back, it's never what we wanted," he says.

Because Wright already had Sun Microsystems, Inc. terminals, he was able to buy Interleaf, Inc. software and be up and running in time to meet his deadline. Since that time, he has purchased 15 more copies of Interleaf's Technical Publishing Software 4.0 program, and most of his engineers create original drafts on them.

Now, Wright says he is a true believer of decentralization and feels that this will become a trend.

"I can now outrun any mainframe with about one-tenth the cost and do it better," he says. Wright adds that he feels he has the ideal setup because he has placed the output source nearer to where the input source is.

Because of the technical nature of the material his engineers work on, disastrous results can happen if there are errors, Wright explains. Yet long columns of numerical data, which he typically uses in his reports, are just the type of data that typesetters have trouble getting right.

And because Wright's documents generally include not only text but also many different graphic elements, including diagrams, flowcharts and schematics, it is much easier to manipulate them on a screen than to hope a printer lines them up correctly.

Finally, because the data is constantly changing, having the operation in-house allows Wright to alter data up to the last minute. By placing publishing and document creation in the same hands, Wright says he is able to decrease turnaround time by one-quarter and increase accuracy.

While Wright does use MIS to give him spreadsheet and database functions from the mainframe, he says MIS is not involved in any aspect of the publishing operation. This new independence required purchasing some equipment in increments to avoid the requirement that MIS sign off on it.

LARRY STEVENS

formerly a typesetter, is responsible for maintaining the department's Apple Computer, Inc. Macintoshes, IBM PCs, Sun Microsystems, Inc. terminals and Docupro, Inc. software, as well as doing some Unix programming.

Paralo does, however, call on MIS for consultative assistance in two areas. One problem she needs help in relates to the production of proposals, which requires tapping into the corporate database. For that purpose, Paralo has depended on MIS to set up the links and security safeguards so that her department can get the data it needs.

Electronic generation of proposals is already critical and is likely to become more so as time goes on, Paralo says.

"In the proposal area, CEP is no longer a luxury," she says. "Now that the government knows that our industry is capable of producing it, they are becoming so demanding that we simply couldn't reasonably create a proposal using an outside printing house, even if we wanted to."

> "BEFORE MIS involvement grows, the engineering, marketing and other departments that feed us things have to have data in electronic form. MIS can't help us if our users want to scribble something on paper and send it to us by messenger."
>
> SARAH PARALO
> ACUREX

Paralo is also working with MIS to maintain the Kermit and Ethernet network links between her department and the company's 130 Digital Equipment Corp. VAX terminals.

The network allows her to receive and send information needed for the development of publications; in addition, it enables her to communicate with those in the organization who use her department's services. She also expects MIS involvement to grow as more people in the company adapt to doing their work electronically.

"While some engineers are totally on keyboard, some still handwrite or cut and paste," she says. "Before MIS involvement grows, the engineering, marketing and other departments that feed us things have to have data in electronic form. MIS can't help us if our users want to scribble something on paper and send it to us by messenger."

Paralo sums up her relationship with MIS this way: "MIS helps get the

ASK THE VENDOR

When I import Claris Corp. Macdraw images into Aldus' Pagemaker and print out the file, the printed images are all broken up; the image placement doesn't even match what's on the screen. How can I fix this?

Gary Reymond
Advertising Program Manager
SCM Office Supplies Group
Marion, Ind.

ALDUS CORP.: The problem is inherent in the Pict format in which Macdraw images must be saved for placement in Pagemaker. Pict images have a resolution of 73 dot/in., which higher resolution printers have trouble interpreting correctly. Enlarging the image in Pagemaker magnifies the problem.

For best results, import graphics such as those drawn in Aldus Freehand or Adobe Illustrator in the Encapsulated Postscript format, which solves these alignment and distortion problems.

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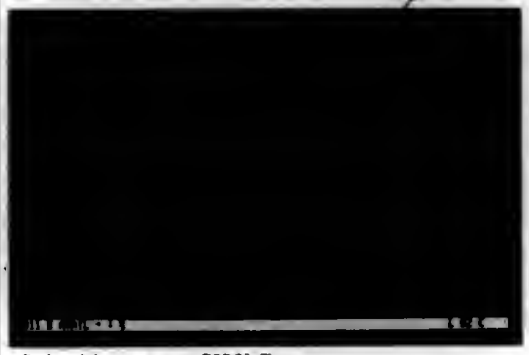

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material to us. We're responsible for formatting the document, editing it, [providing] technical writing support if necessary, assigning photography, creating a binder and interfacing with the photo lab and art department. There is no way anyone can even imagine that any of that should be under MIS' purview."

While MIS does have to sign off on hardware and software purchases, Paralo says that this requirement rarely precipitates a conflict.

The relationship between CEP and MIS is also a good one at General Atomics, Inc., a San Diego-based company that does research in nuclear energy. But that affinity is probably to be expected, because CEP is handled there through the company's information center. What is more remarkable in that circumstance is the degree of separation that can be observed.

According to Nancy Hodder, manager of the information center at General Atomics, MIS and the information center have clearly defined roles. MIS controls the data, and the center controls the output. All the data is stored on the corporate mainframe and all proposal writing, which is the major publishing application, is done on Microsoft Corp.'s Word-II, also on the mainframe.

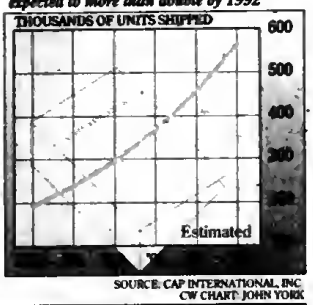
The software, hardware and connections to the mainframe are controlled by MIS, but once the data leaves the mainframe and goes to General Atomics' Interleaf, Inc. Technical Publishing Software system, it becomes the responsibility of Hodder's department.

"We take care of all installation, communication and repair of the terminals as well as teaching courses to others in the corporation," she says. "We get a lot of support from MIS when we have to interface with their equipment."

It remains to be seen whether more active MIS intervention in electronic publishing will become necessary. SEI's Prescott says that many organizations are now considering the creation of a new position called chief publications officer, who will have overall control of the operation. It is not expected that this person will either emerge from or report to MIS, but instead will likely look to that department for consultative assistance and additional support. •

Gaining ground

Corporate electronic publishing product shipments to corporate end users are expected to more than double by 1992



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CW CHART: JOHN YORK

MIS role to grow

What does the future hold for corporate electronic publishing?

According to Anthony Deakins, vice-president and general manager of the Composed Output Applications Division of Cincinnati Bell Information Systems, future advances in technology will naturally bring about changes in corporate electronic publishing. He sees such advances as checking account statements with scanned images of checks and more graphs with telephone and utility bills.

But he adds, "The first step is to find reasonable ways to store and transmit disparate forms of data including object-oriented and bit-mapped graphics along with text."

One innovation in this area occurred in September with Digital Equipment Corp.'s release of the specifications for its Compound Document Architecture (CDA). The CDA specifications define a networked environment for creating, revising, managing and distributing compound documents containing links to text, graphics, images, spreadsheets, charts and tables. These links are "live" in the sense that the data is automatically updated when the source data is updated.

Deakins says corporate electronic publishing today is more concerned with fonts and line spacing than with networking and direct-access storage devices. But when CDA becomes implemented and custom documents that require extensive use of the database become more common, electronic publishing will gradually move closer into MIS' purview.

"Right now, MIS has to be ready to provide the networking and storage support for corporate electronic publishing," he says. "As the technical issues become more complicated, it will have to do a lot more."

LARRY STEVENS

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Two IC/Ps set new pace

But IBM and Xerox take different architectural approaches

BY DAVID HUDSON

Large-scale in-house publishing is made possible by cost-effective high-speed — 80 page/min. and above — nonimpact printers. These peripherals are often referred to as centralized intelligent copier/printers (IC/P).

For publishing applications, these devices must be graphics capable and accept cut-sheet paper as opposed to data processing fanfold stock. Duplex, or two-sided, imaging is also required.

Last year, both IBM and Xerox Corp. introduced IC/Ps targeted at the high-volume in-house publishing market. In February 1988, IBM rolled out the 3827, the company's first high-speed cut-sheet printer. The copier provides print speeds of up to 92 image/min. with a resolution of 240 by 240 dot/in. List price is $193,000.

Seven months later, Xerox, the historical market leader in high-speed cut-sheet printing, introduced the 4090. The 4090 also prints at speeds up to 92 image/min. but has a resolution of 300 by 300 dot/in. List price is $190,000 for an IBM 370 channel-attached configuration.

Although the two printers are positioned closely in speed and price, they take different architectural approaches to resource and document management.

IBM's 3827 is based on an LED print engine and incorporates an IBM Advanced Function Printing (AFP) controller. AFP is an umbrella term for IBM's Systems Application Architecture (SAA) printing architecture. Its significance, like SAA's, lies in IBM's move to standardize various protocols across operating systems and hardware platforms.

With the 3827, IBM hopes to move its customer base from widely varying printer data streams to the page description language-like AFP formats. By introducing advanced printers with AFP-only controllers, IBM is prodding its customer base to develop new applications, possibly for publishing, and migrate older applications to the new standards.

Architecturally, the 3827 has a symbiotic relationship with its driving host. Fonts, forms, graphic images and format command files are stored in AFP software resource libraries on the host. Document data streams are routed to the AFP software driver, the Print Services Facility, which manages resource allocations to the 3827 and converts the data stream to one that is specifically bound to the receiving printer. A two-way printer-host dialogue allows the host to establish the present resource status of the printer to avoid redundant downloading.

LAST YEAR, both IBM and Xerox introduced IC/Ps targeted at the high-volume in-house publishing market.

IBM's host-based approach to printer intelligence offers the traditional advantages of centralized management. Printing resources such as forms and fonts can be directed to any compatible (read AFP) printer on the network. Maintaining a single resource copy also makes version management simple.

Disadvantages of the 3827 include the need to download graphics-intensive resources at print time if they have not been cached, which ties up valuable communications bandwidth and slows throughput.

The Xerox 4090 uses laser imaging and is based on Xerox's 1090 copier engine, which is coupled with a stand-alone controller unit housing a Digital Equipment Corp. J11 processor and hard-disk subsystems for resource storage. The 4090 attaches to an IBM host as an IBM 3211 protocol line printer. Xerox's approach to printer intelligence puts the processing power in the printer itself. With local hard-disk storage capacity of up to 1.1G bytes — 370M bytes is standard — the printer can store massive amounts of imaging resources such as scanned images, fonts and forms.

Data files can also be buffered for printing multiple-document copies without data file retransmission from the host. By locally storing graphically intensive resources such as font bit-maps, throughput is enhanced at print time.

The disadvantages of this approach are those typical of distributed processing in general. In a multiple-printer network, each printer must have a local copy on hard disk of each required resource. Managing multiple copies of resources is difficult. For example, when updating a stored form, the new version must be loaded to all the printers. Utilities that facilitate resource management also add overhead.

Offering cut-sheet duplex printing, average monthly print volumes in excess of one million pages and optional postprocess paper handling, both machines are solid platforms for in-house publishing of high-quality documents. •

Hudson is an analyst at CAP International, Inc.'s Intelligent Copier/Printer Market Requirements Service, which is located in Norwell, Mass.

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Mixed-platform publishing challenges systems managers

BY PATRICIA McGREW AND WILLIAM McDANIEL

Imagine for a moment that some of your text files reside on a personal computer network, some on a workstation and some on your mainframe. You also have graphics and data that you want to share among departments. File-transfer software allows you to move files from one environment to another, but how do you keep track of where each file is and when it was last updated?

What you have been imagining is a mixed publishing environment, and it is the new challenge for systems managers.

Mixed environments, especially those that involve networks, provide almost unlimited flexibility. That degree of freedom is a blessing in some ways for document resource management, but it can also be a curse.

On the positive side, users can share resources produced by different departments, each of which uses a different computing system. End users can take advantage of the best features of each of the processor platforms while sharing the fruits of their labor across those platforms.

For instance, host-based graphics tools are heavy resource consumers and lack many of the features of PC-based tools. Alternatively, host-based chart design facilities are usually more powerful than their micro-based counterparts. PC software typically offers better tools for improving the writing and readability of documents; comparable software is often difficult to find in the mainframe environment. Inexpensive proofing printers or high-quality laser printers are usually attached only to PCs, while high-speed production printers are typically attached to a mainframe.

THE MOST important part of managing the environment is understanding what types of files can be created and how portable they may be within a mixed setting.

Managing document resources in this kind of environment requires very careful planning and monitoring in a variety of areas. Strategies must be mapped out for text creation, graphics, composition and target printers. File-transfer methods must be weighed and measured. Font compatability across all printers must be arranged, and a method must be found for tracking where all files are at all times.

The most important part of managing the environment is understanding what types of files can be created and how portable they may be within a mixed setting. A manager must be acutely aware of which products are being used on all platforms, what text file formats are supported and what type of printer-ready output each can produce. Even products made by the same vendor are not necessarily compatible across all platforms.

For example, if you try to connect PC environments using Aldus Corp.'s Pagemaker or Xerox Corp.'s Ventura Publisher to other platforms, you will find that the file formats for these products are not completely portable.

It is possible to produce Adobe Systems, Inc. Postscript files from these products, transfer them to the mainframe, execute the Postscript to an IBM AFPDS Interpreter and print on a host-attached Advanced Function Printing printer. But this route would have to be repeated each time a source file changed. Exactly the same path must be taken, by the way, if you use Interleaf, Inc.'s Interleaf Publisher interface, which permits files to be transferred to the host.

It is even more difficult to integrate host-based text or raw data into the PC page makeup environment. You could use a product like IBM's Markup, which is considered to be a text-entry tool, to create text files on the PC that can be transferred to the mainframe and composed using IBM's Document Composition Facility (DCF). However, working across platforms usually means using a text editor — a host-based product or a micro-based one such as Mansfield Software Group, Inc.'s Kedit or Phaser Systems, Inc.'s Micro/SPF — to create raw text files that may contain composition language markups or format instructions that one would see on a printer-ready file.

If users create text files on a standalone word processor or a host-based office system product, the problem of compatibility becomes even more acute. These files will not be directly compatible with pure text files created with a text editor on either a PC or a host. IBM's Office Document Facility can be used to

McGrew and McDaniel are co-authors of *In-House Publishing in a Mainframe Environment* and *On-line Text Management in an IBM Mainframe Environment*, both published by McGraw-Hill.

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transfer such files to a host system in a DCF-compatible format, but the files that end up on the host use a primitive set of DCF Generalized Markup Language; if they are modified in any way, they cannot easily be sent back to the originating office system platform.

If graphics are used within text files, there are just as many formats and just as many extra steps with which to contend. Furthermore, regardless of their original format, all graphics must finally be translated into either raster images, which are rectangular arrays of dots represented by strings of binary numbers, or into a page description language such as Postscript.

If a raster image is required, it must not be translated when it is transferred between the host and the PC, so careful control of the file-transfer method is vital. It is also important to know if the originating software platform can translate the file back to the original form if changes are made in a different environment.

MOST IBM printers are 240 dot/in. devices, while most other printers are 300 dot/in. These resolution differences make it impossible for documents to look identical even if the same fonts have been provided for both.

Other questions are involved in managing the composition process in a mixed environment. You must know whether you maintain printer-ready files and, if so, the type of printer to be used and where it is attached. You must know whether all the printers use the same data stream. And, if not, you must decide whether to use software to convert the data stream or recompose for each type of printer. Then, too, there are the complications that arise because fonts are printer-specific and fonts available for one printer may not be available for use with another.

Fonts and printers vary in their resolutions. When a document arrives at a printer, it has been transformed into a specific data stream with references to printer-specific fonts. The text has been set assuming a specific resolution. It is difficult to ensure that a document will look the same on both a host-based and a PC-based printer. Most IBM printers are 240 dot/in. devices, while most other printers are 300 dot/in. These resolution differences make it impossible for documents to look identical even if the same fonts have been provided for both. The difference in resolution adds up to different line and page breaks.

The advent of Postscript as a de facto standard for many printer vendors may alleviate this problem to a considerable degree because Postscript's fonts are resolution independent. That still leaves the manager with the question of whether all the printers throughout the environment are Postscript compatible and whether the specified fonts are available.

File-transfer software is, of course, required in a mixed environment. Commercial software can be used, but if you have the time to create your own, it is possible to build in tracking functions that will prove helpful when files are moved from one platform to another.

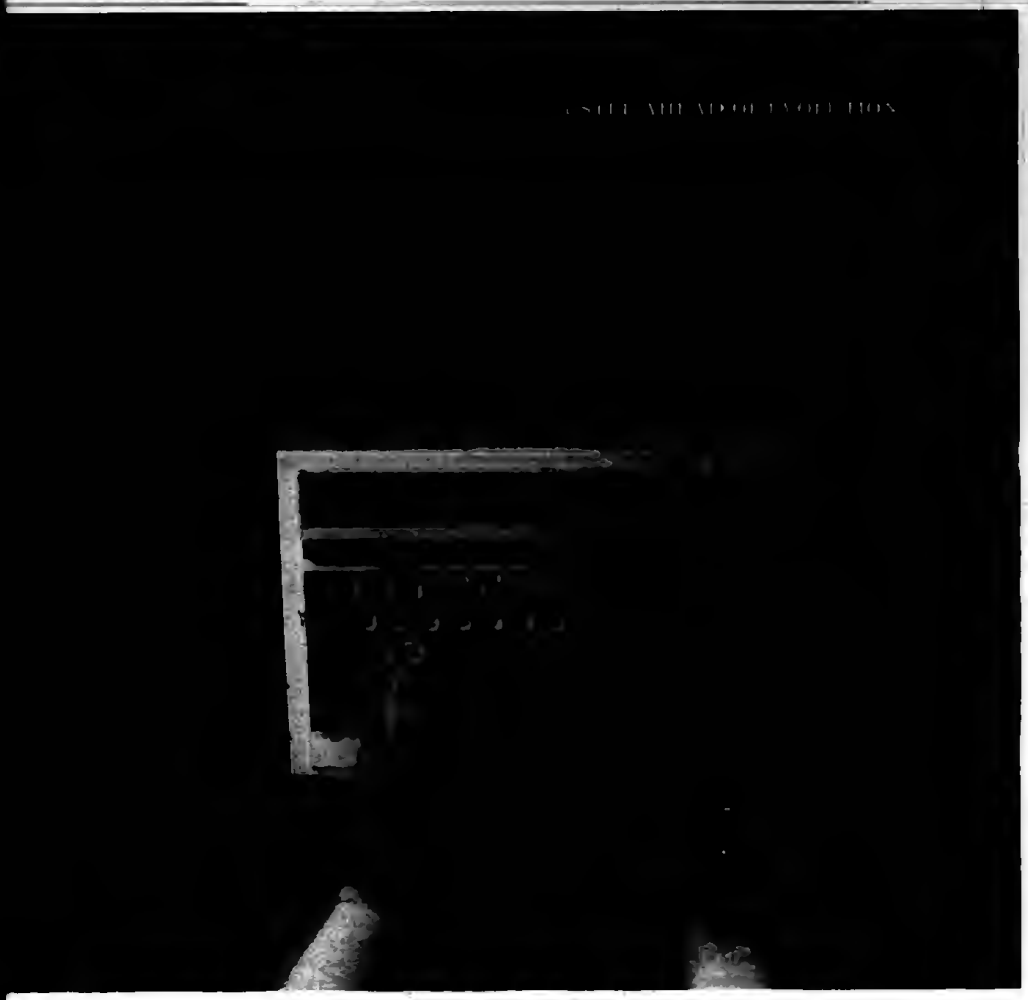
There is little in the way of automated solutions to manage text files created on more than one platform. Most people start out by creating their own file management methodology by using naming conventions to identify the home location of a given file. Programs can be added later to warn a person changing a file in one place that the same file exists elsewhere at a higher revision level. Alternatively, some managers settle on a library-based system, which requires that a file be checked out from and returned to a specific platform.

The only certain fact in this kind of situation is that managers of mixed-document-composition environments are forced to rely on their own ingenuity. •

Suggested procedures

Recommended steps for making document resource management work in a mixed environment are as follows:

- Review technical requirements for text entry, graphics, composition, printing and file transfer before you try sharing files across platforms.
- Make sure that file formats are compatible across all environments.
- Provide tools for transferring files between platforms that minimize the need for user intervention.
- Appoint a controller to oversee hardware and software use and acquisition.
- Develop internal tracking of source files by where they reside, what documents use them and who controls them.
- Determine whether it is better to maintain print-ready files to permit demand printing or to recompose all files on an as-needed basis.



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INTERVIEW
Intersection with image processing

Woodrow H. Vandever Jr. is executive vice-president at Interconsult, Inc., a Cambridge, Mass.-based research and consulting company that specializes in new information technologies, including those associated with electronic publishing. Vandever recently spoke with *Computerworld* Senior Editor Joanne Kelleher about the ways in which he sees the technologies of electronic publishing and image processing converging.

You say that there eventually will be a merging of electronic publishing technology and image processing technology. Why do you think this is inevitable?

I think it has to occur, because without it, you are not going to be able to take full advantage of electronic publishing. This evolutionary step is necessary because of the volumes of information that electronic publishing will generate. As this information begins to expand, you run into immense problems involving the storage of electronic databases, the management of versions and revisions of documents and the distribution of information throughout the corporation.

When you look at it that way, the need for immense archivable volume storage is a natural outgrowth of this process. You need large amounts of storage, and you need efficient software access mechanisms for image, text and numeric databases, and then you need a way to disperse it throughout the corporation.

Can you clarify that connection?

Right now, the vendors of image processing systems are responding mostly to the needs of a customer base that was previously buying microfilm, and they save the information in raster format vs. some kind of a logical format. They don't know that documents of the future are going to be done electronically, and hence, the source material is already in some kind of an object orientation, such as characters or vectors.

When you stop to think about it though, these systems are nothing more than large, archivable electronic storage devices for documents that the corporation or government agency uses.

How do you see this affecting either the scope or the content of corporate electronic publishing?

I think it affects the business more than it actually changes corporate publishing. It is a mutual rather than causal relationship. The major impacts will be that you will be able to optimize the use of information — making it available to people in a way that is as easy as electronic mail.

Is this important because corporate publishing is becoming a more strategic undertaking?

Absolutely. In addition to accessibility, what you are talking about is turnaround time.

You can interact with your customer more rapidly. You can get your document out. If you are a manufacturing corporation, one reason that corporate electronic publishing looks so nice is not just the hard cost savings but the soft cost savings. For example, most manufactured goods cannot be shipped without the documentation. But in all cases, the documents are always the last entity in the process because usually, the product keeps getting modified and changed until it is finally produced.

Image processing systems are not set up right now to accommodate the kind of varied input and widespread exchange that you are talking about. What would have to happen in order to make them effective vehicles for corporatewide archivable electronic storage?

First of all, there has to be a recognition that image processing is no longer a unique entity. Image processing is really an outgrowth of automating microfilm/microfiche, which were optomechanical means for reducing the volume of paper that people needed to save while still keeping the information it contained accessible.

When image processing came along, people realized that they could scan information in and keep it electronically, ship it around the system and display it electronically.

But they are still treating it as if it were hard copy and the best compaction you can get, over the number of bits that you have to save per page, is probably around 80. And most people don't get anywhere near that.

But effective compression of information would be a must to deal with the kind of volume you are talking about. How can image processing systems be adapted to accommodate a larger volume?

One of the problems with image processing is the sheer volume of data that you have to carry around and store.

If you have to save little rasters, you wind up, at resolution of 300 by 300 dot/in., with 9 million bits or roughly one megabyte of information for an 8½- by 11-in. page. People use different compaction schemes, but they tend to wind up having limits of about an 80-to-1 ratio for compression. And that still means 12,000 bytes for a single page.

If, as information becomes electronic, you can save the things in a logical format, then you have a higher data compaction, you effectively have object recognition occurring. And that is invariant, small, compressed — and you can save a lot more of it.

On the output side, for example, the industry has pretty much settled on Postscript as the de facto output media in the non-IBM mainframe world. And Postscript can actually be thought of as a compaction scheme because it not only contains the document format and textual information but also effectively contains large numbers of the images in kind of a vector or programming format.

Image processing systems need to be able to take advantage of that kind of efficiency, capturing the large volumes of newly generated documents in either the output or interchange formats where they reside, because these formats are much more efficient in terms of compression.

It is true that some image processing systems use CCITT Level IV, which is a very compressed format, but a lot have their own special formats.

Woodrow Vandever Jr.

And that is a problem, not only in terms of compression but also compatibility, right?

True. As interchange standards such as ODA/ODF [Office Document Architecture/Office Document Facility], SGML [Specialized General Markup Language] and CDA [Digital Equipment Corp.'s Compound Document Architecture] become available, then large numbers of documents in the system will want to be able to live in the interchange format, so that the information is reusable — can be modified, changed, grabbed in sections, and so on.

When that happens, people will also want be able to disseminate that information throughout their companies, across the network, and use the standard terminals on their desk to see it. And that means image processing systems are going to have to

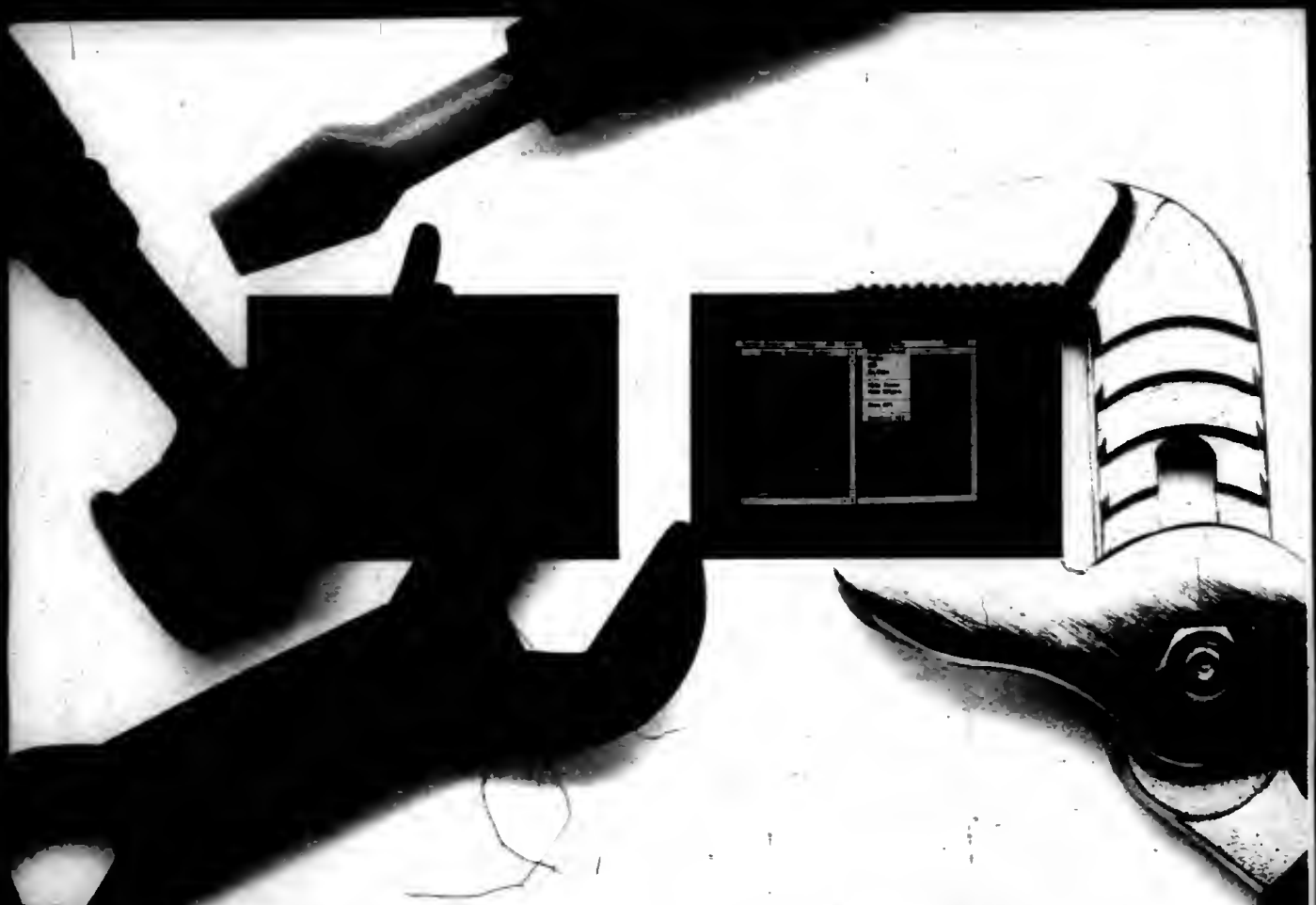
Continued on page 71

Document composition software

COMPANY	PRODUCT NAME	HARDWARE SUPPORTED	NETWORK COMPATIBILITIES	MENU-DRIVEN	MEMORY REQUIRED (IN BYTES)	WORD PROCESSING SOFTWARE SUPPORTED	TEXT EDITORS SUPPORTED	SCANNERS SUPPORTED	OUTPUT DEVICES SUPPORTED	WYSIWYG[1] CAPABILITIES	GRAPHICS FORMAT STANDARDS SUPPORTED	TEXT MANIPULATION OPTIONS	IMAGE MANIPULATION OPTIONS	PRICE
Acom Plus (213) 876-5237	Eclaser	IBM PC, PC XT, AT and compatibles	Novell Advanced Netware	Yes	NP	Microsoft Word, Wordperfect, Displaywrite, Multimate, Wordstar	None	HP Laserjet	No	No	NA	Automatic justification, automatic ragged-right edge, multiple columns	None	$99.95
Aldus Corp. (206)622-5500	Pagemaker for the PC	IBM AT, PS/2 and compatibles, DEC Vaxmate, HP Vectra PCs, Olivetti M280, Tandy 3000/4000, Wang PC 200 and 300	3Com 3+, Novell Netware, Tops, IBM PC Network and Token-Ring	Yes	640K	HP Advancewrite Plus, Executa; Microsoft Word, Multimate Advantage II, Officewriter, Oltext Plus, PC Write, Windows Write, Wordperfect, Wordstar, WFS-Plus, Xyquest Xywrite III*	Built-in	Any Postscript-compatible, Linotronic 100/300/500, Compugraphic 8000/8400/-8600, Varityper 6700, Epics 20/20, Crtronic 150-350	Yes	Yes	PCX[2], TIFF[3], HPGL[4], DDL, Bitmap	Kerning, hyphenation, auto-text flow, auto-text threading	Crop, resize, reposition, 10 fill patterns	$795
	Pagemaker for the Macintosh	Macintosh Plus, SE, II	Appleshare, Tops, 3+ Mac	NP	512K	Macwrite, Microsoft Word, Works, T/Maker Writenow, Wordperfect, Wordstar, Xywrite III	Built-in	Postscript-compatible, Quickdraw-compatible laser printers, Linotronic 100/300	Yes	Yes	TIFF, Pict[5], EPS[6], Bitmap, Macpaint file formats	Auto-text flow, auto-text threading	Resize, reposition	$595
Arbortext, Inc. (313) 996-3566	Mtex, Preview, DVIlaser	IBM PC, XT, AT, PS/2 and compatibles	IBM Network File System	No	512K	Internal	Any that produce ASCII text files	Laserjet Plus and Series II; QMS, Imagen, any Postscript-compatible	No	Yes	Bitmap	Multicolumn text, tables, mathematical formulas, auto-index, tables of contents	Landscape, portrait, magnify, shrink	$400
	Tex, Latex, Preview, DVIlaser	Sun, Apollo, VAX/VMS, VAX/Ultrix	IBM Network File System	No	1M	Internal	Any that produce ASCII text files	Laserjet Plus and Series II; QMS, Imagen, any Postscript-compatible	No	Yes	Bitmap	Multicolumn text, tables, mathematical formulas, auto-index, tables of contents	Landscape, portrait, magnify, shrink	$1,000 for one node
	The Publisher	Sun Series 3 and Series 4	IBM Network File System	Yes	4M	Proprietary	Proprietary	Imagen, any Postscript-compatible	Yes	Yes	Bitmap	Mathematical formulas, auto-index and tables of contents, formatting by paragraph	Rotate, scale	$3,495
Ashton-Tate Corp. (213) 329-8000	Byline 2.0	IBM PC, XT, AT, PS/2 and compatibles	None	Yes	512K	Multimate, Advantage II, Xywrite, Displaywrite RFT/DCA, Wordstar, Wordperfect*	Any that produce ASCII text files	NP	Yes	Yes	PCX, GEM[7], DMG[8], Compuserve RLE, Macpaint	Kerning, word/letter spacing, auto-text flow, auto-column creation	Crop, invert, rotate, scale	$295
Bestinfo, Inc. (800) 346-7920	Wave4	IBM PC, XT, PS/2, Compaq Deskpro 386 and compatibles	Advanced Netware	Yes	640K	Xywrite III Plus	Wordwrite	Any Postscript-compatible, Linotronic and Compugraphic typesetters	Yes	Yes	HPGL, PC Paint, bitmap	Kerning, auto-column, hyphenation, auto-index	Resize, clip, rotate, reposition	$11,000
Canon USA, Inc. (516) 488-6700	Express Desktop Publisher	Canon 286, 386	None	Yes	1M	Internal	Internal	Canon Laserbeam Printer 200V	Yes	Yes	Lotus Pick files	Kerning, auto-column, hyphenation, justification	Scale, crop, rotate	$9,450 to $11,450 (includes hardware)
Command Technology Corp. (415) 339-3620	GML/PC or GML/2	IBM PC, XT, AT, PS/2 and compatibles	IBM PC Network, Netware, any DOS 3.0 and higher network	Yes	640K	Any that produce ASCII text files	Any that produce ASCII text files	Any Postscript-compatible devices, Laserjet Plus, Series II or compatibles	No	Yes	Vector and raster images, Autocad ADI Plotter, IFS images	Auto-forward and backward cross reference, hyphenation 13 languages, auto- and multiple-level index	None	$995
Computer Associates International, Inc. (201) 874-9000	CA-ETC (Extended Text Composition)	Any IBM or plug-compatible mainframe	CICS	No	400K-500K	Internal	Internal	IBM 3280, 6640, 670	No	Yes	None	Multiple columns, hyphenation, font controls	None	$22,500 to $32,000
Compugraphic Corp. (800) 343-6000	CAPS	All Sun workstations	Ethernet, IBM Systems Network Architecture, Netware, Decnet, Apollo, IBM Token-Ring	Yes	4M	Vista, Wordperfect, Displaywrite, Microsoft Word, Multimate	VI, CAPS Edit	Compugraphic Imagesetters, Postscript-compatible printers	Yes	Yes	IGES*, Sun Raster, Pict	Kerning, tracking, hyphenation, justification	Scale, crop, fill	$40,000 and up
CSI Publishing, Inc. (714) 955-2353	Pagebuilder 2.0	IBM PC, XT, AT, PS/2	Advanced Netware	Yes	640K	ASCII text files	Internal	Laserjet, Epson dot matrix, IBM Proprinter, any Postscript-compatible	Yes	Yes	PCX, DXF[10]	Kerning, auto-column creation, hyphenation	Scale	$299

* Designates partial listing
[1]WYSIWYG: What you see is what you get [2]PCX: bit image format [3]TIFF: Tag image file format [4]HPGL: HP printers [5]Pict: A picture file format [6]EPS: Encapsulated Postscript [7]GEM: Digital Research Graphics Environment Manager [8]DMG: Digital Research Bit Image Format [9]IGES: IBM Initial Graphics Exchange Specification [10]DXF: Data exclusive file [11]CGM: Computer Graphics Metafile [12]GDDM: Graphical Data Display Manager [13]GDS: Unisys Interactive GAMMA Data Manipulation System [14]PANT: Macpant File Format [15]RIFF: Raster Image File Format [16]CUT: Media Cybernetic's device independent image storage file [17]WKS: Lotus worksheet files [18]ETG: Sovtek Easy Text and Graphics Plus

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.



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COMPANY	PRODUCT NAME	HARDWARE SUPPORTED	NETWORK COMPATIBILITIES	MENU-DRIVEN	MEMORY REQUIRED (IN BYTES)	WORD PROCESSING SOFTWARE SUPPORTED	TEXT EDITORS SUPPORTED	SCANNERS SUPPORTED	OUTPUT DEVICES SUPPORTED	WYSIWYG[1] CAPABILITIES	GRAPHICS FORMAT STANDARDS SUPPORTED	TEXT MANIPULATION OPTIONS	IMAGE MANIPULATION OPTIONS	PRICE
Data Transforms, Inc. (303) 832-1501	Fontrix for IBM	IBM PC, XT, AT and compatibles	Omninet, Netware	Yes	NP	Any that produce ASCII text files	Any that produce ASCII text files	150+ printers	No	Yes	Proprietary	Auto-justification, proportional or nonproportional fonts	Rotate, flip, mirror image	$155
	Fontrix for Apple	Apple Macintosh II Plus, IIE, IIC, IIGS	None	Yes	NP	None	None	150+ printers	No	Yes	Proprietary	Proportional and nonproportional fonts	Rotate, flip, mirror image	$95
	Printrix for IBM	IBM PC, XT, AT and compatibles	Omninet, Novell Netware	Yes	NP	Wordperfect, Microsoft Word, Wordstar, Wordstar 2000	None	150+ printers	No	No	Proprietary	Proportional and nonproportional fonts	Portrait	$165
	Printrix for Apple	Macintosh IIE with extended 80-column card, IIC, IIGS	None	Yes	NP	Appleworks, Applewriter 2, Wordperfect	None	150+ printers	No	No	Proprietary	Proportional and nonproportional bold and degree of bold, italics	Portrait	$65
Digital Composition Systems (602) 870-7667	DBpublisher	IBM AT, PS/2 and compatibles	None	Yes	560K	Wordperfect, Microsoft Word, Multimate, Wordstar, Xywrite III+	Any that produce ASCII text files	Laserjet Plus, Series II and compatibles, any Postscript-compatible	No	Yes	PCX, PIC, IMG, TIFF, EPS, Macintosh document files, HPGL	Kerning, hyphenation, font definition, widow and orphan control	Scale	$695
Digital Research, Inc. (408) 469-3896	GEM Desktop Publisher, Release 2	IBM PC, XT, AT and compatibles	None	Yes	640K	GEM Write, GEM 1st Word Plus, Wordstar, Multimate, Wordperfect, RFT/DCA, Microsoft Word	Any that produce ASCII text files	NP	NP	Yes	GEM, IMG, PCX, PIC, TIFF	Kerning, tracking, hyphenation, auto-page numbers	Patterns, crop, scale, color	$295
Eastman Kodak Co. (800) 225-3434	Kodak Ektaprint Electronic Publishing System.	Sun workstations	Ethernet, TCP/IP, Decnet	Yes	4M	DEC/DX, Wang, Multimate, Macwrite, Wordstar, Wordperfect, Peach Text, Xerox 860, Wordmarc, Samna[a]	NP	NP	Yes	Yes	IGES, HPGL, Macpaint images, Macdraw images	Auto-table of contents, index, column creation, widow and orphan control	Scale, crop, rotate, clone	NP
Electronic Arts (415) 571-7171	Instant Pages	IBM PC and compatibles	None	Yes	256K	Internal or imports, any that produce ASCII text files	Internal or imports, any that produce ASCII text files	Epson FX-80, LQ, HP Laserjet, IBM Proprinter	No	Yes	None	Unlimited number of columns, resize columns, auto-reflow of text	None	$49.95
Frame Technology Corp. (408) 433-3311	Framemaker	Sun Microsystems workstations	Unix-based systems	Yes	4M	Proprietary	Vi, Emacs	Any Postscript-compatible, Imagen laser printer	Yes	Yes	HPGL, IGES, EPS	Hyperation, auto-reformatting of text, auto-column creation, bookmaking facility	Scale, crop, annotate, mirror	$2,500 per license
Good Ideas (508) 475-7328	Type-Set-It	IBM PC, XT, AT, PS/2 and compatibles	Netware, 3+, Tops	Yes	512K	Any that produce ASCII text files	Any that produce ASCII text files	All IBM and Epson 9 & 24 pin dot matrix printers, Laserjet, Series II	No	Yes	None	Kerning, hyphenation, justification, free-form design	None	$395
Graphics Development International, Inc. (413) 382-6600	Formeasy	IBM PC, XT, AT, Intel 80386-based systems, PS/2 and compatibles	Any	Yes	640K	Wordstar	Internal	Any Postscript-compatible, Laserjet, Canon, Xerox Interpress, IBM 3812	Yes	Yes	PCX	Auto-column creation	Scale	$495
Habe Arrays, Inc. (818) 994-1899	Front Page Publisher	IBM PC, XT, AT and compatibles	Any	Yes	640K	Any that produce ASCII text files	Built-in	Any Postscript-compatible, separate module for typesetters	Yes	Yes	PCX, TIFF, PICK, HPGL, SYLK, Lotus	Auto/manual leading, kerning, hyphenation, free-form design	Crop, scale, resize, text wrap	NP
Honeywell Bull, Inc. (617) 895-6000	Onedocument Compound Document	Honeywell Bull DPS 8 Plus	Ethernet, Open Systems Interconnect LAN	Yes	NP	Onetext document processing	NA	Honeywell Bull Models 80, 85	Yes	Yes	CGM[11], TIFF	Spelling check, paginate, hyphenate, specify up to 20 different fonts in a document	Scale, highlight, merge	$660 to $1,010
IBM Contact your local IBM sales office	IBM Publishing Systems Master Series	IBM 370 architecture	RSCS, SNA	No	NP	Displaywrite, any that produce ASCII files	Any that produce ASCII files	IBM 6250/IL 3820/3812, 1403, 3800	Yes	Yes	TIFF, GDDM[10], Bitmap, IOCA, IMDS, IBM AFP, IGES	Named styles, document version control, symbol substitution, device independence	Annotate, scale, rotate, crop	$3,500 to $8,500
	IBM Interleaf Publisher	IBM PS/2 with 80386 processors	NP	Yes	NP	Internal, any that produce ASCII text files	Internal	IBM 4218, any Postscript-compatible printers	Yes	Yes	TIFF, Bitmap, EPS, IMDS	Revision tracking, text in frame, book facility, index generation	Paging/clone, gray level, size, rotate	$2,495
Intergraph Corp. (800) 826-3515	DP/Publisher	Intergraph Clipper-based workstations and servers	Ethernet	Yes	6M	Wordperfect, Mass-II	DP/Publisher	Intergraph laser printers, imagesetters, film recorders, any Postscript-compatible	Yes	Yes	IGDS[13], IGES, CCITT Group IV	Complex tables, math equations, mixed columns	Variable zoom, multiple attach, annotation, clip box	$2,000
Interleaf, Inc. (617) 577-9800	TPS/Publisher	Apollo, Sun, DEC, IBM Personal Computer RT, PS/2 Models 70, 80; Macintosh II	Ethernet	Yes	NP	DEC DX, Macwrite, Multimate, Scribe, Wordstar, Wordperfect, Textfit, NBI	Built-in	Interleaf laser printers, Apollo Domain Laser, IBM 3812 and 4216, any Postscript-compatible, Compugraphic 8600, Linotronic	Yes	Yes	HPGL, IGES, TIFF, EPS, graphics filters	Auto-column, spell checker, auto-page numbering, kerning	Zoom, gravity function, group, size, duplicate, stretch, rotate, flop	$2,495 to $12,500
International Microcomputer Software, Inc. (415) 454-7101	IMSI Publisher	IBM AT, PS/2 and compatibles	None	Yes	640K	Wordstar, Microsoft Word, Wordperfect, Multimate	NA	Canon, IBM Proprinter; Laserjet Plus, Series II and Deskjet; Epson, NEC; Toshiba	Yes	Yes	PCX, TIFF	Auto-text pagination, intelligent text importation from word processor, spelling checkers	Scroll-through image library, auto-gray scale	$495

COMPANY	PRODUCT NAME	HARDWARE SUPPORTED	NETWORK COMPATIBILITIES	MENU-DRIVEN	MEMORY REQUIRED (IN BYTES)	WORD PROCESSING SOFTWARE SUPPORTED	TEXT EDITORS SUPPORTED	SCANNERS SUPPORTED	OUTPUT DEVICES SUPPORTED	WYSIWYG[1] CAPABILITIES	GRAPHICS FORMAT STANDARDS SUPPORTED	TEXT MANIPULATION OPTIONS	IMAGE MANIPULATION OPTIONS	PRICE
Itek Graphics Corp., a division of IGX Corp. (603) 889-1400	PTW	IBM AT and compatibles	Netware	Yes	640K	Wordstar, Wordperfect, PFS	Proprietary	IGX 7000+ 5000	Yes	Yes	Most via optional conversion pattern	Kerning, hyphenation, .5 point sizing, unlimited font sizing	Horizontal and vertical scale, flop, rotate	$19,000 with IGX typesetter
L/Tek, Inc. (516) 758-3630	Spellbinder Desktop Publisher	IBM PC, XT, AT and compatibles	None	No	384K (640K recommended)	Internal	Internal	Laserjet, Plus and Series II, any Postscript-compatible	Yes	Yes	PCX, IMG	Kerning, auto-column creation, auto-line spacing, leading	Scale, shrink, enlarge	$595
Lasermaker, Inc. (213) 372-3209	Lasermaker	IBM AT, PS/2 and compatibles	Any DOS networks	Yes	640K	Any that produce ASCII text files	Proprietary	Any Postscript-compatible	Yes	Yes	PCX, TIFF, IMG, GEM	Kerning, auto-column creation, hyphenation, justification	Size image, import image	$1,495-$3,850
Lattice, Inc. (800) 533-3577	High Style	IBM PC, XT, AT, PS/2 and compatibles	Any IBM network	Yes	256K	Any that produce ASCII text files	Any that produce ASCII text files	Laserjet and compatible	No	No	Proprietary	Kerning, auto-column creation, hyphenation, auto-headers	None	$375
Lollough Software Corp. (800) 532-2844	Leprint 3.0	IBM PC, XT, AT and compatibles	None	No	384K	Displaywrite IV, Microsoft Word, Xywrite III, Wordperfect, PC Writer, Officewriter, Volkswriter[9]	NP	Any non-Postscript printers, dot matrix	No	No	PCX, TIFF	Bold, italic, condense, change size	None	$195 to $395
Letraset (201) 845-6100	Ready Set Go 4.5	Macintosh Plus, SE, II	Apple-compatible networks	Yes	1M	Hesser Software Works, Microsoft Word, Macwrite, Airus Write Now, Wordperfect	Internal	Any Postscript-compatible, most Quickdraw-compatible	Yes	Yes	Pict[14], Pict, Pict 2, TIFF, EPS, RIFF[15]	Fractional kerning, vertical justification, case conversion	Gray-scale editing, optional runaround and offset, 52 pen or fill patterns	$495
Magna Computer Systems, Inc. (516) 986-9233	Magnatype	IBM PC, XT, AT and compatibles	Any Netbios-compatible network	Yes	640K	Any that produce ASCII text files	Any that produce ASCII text files	Any Postscript-compatible printers and most major typesetters	Yes	Yes	TIFF, Microtech I-Star	Hyphenation, justification, tracking, letter spacing	Rule manipulation	$7,500
McCutcheon Graphics, Inc. (416) 636-6070	Page One Book Publishing Software	Macintosh Plus, SE, II, IIx	Tops, Appleshare	Yes	NP	Microsoft Word	Any that produce ASCII text files	Any Postscript-compatible devices	Yes	Yes	None	Fully automated	None	$1,500
Media Cybernetics, Inc. (301) 495-3305	Halo DPE	IBM PC, XT, AT, PS/2 and compatibles	None	No	NP	Any that produce ASCII text files	Any that produce ASCII text files	Laserjet, AST Research, Canon, Epson, Genicom, IBM Jetprinter, NEC, Okidata, Sharp, Toshiba, Xerox	Yes	Yes	CUT[16], TIFF, IMG	Infinite sizing, text at any angle, dropshadows	Rotate, scale, pixel-by-pixel edit, cut and paste	$195
Micropro International Corp. (415) 499-1200	Wordstar 5	IBM PC, PS/2 and compatibles	3+, Advanced Netware, IBM Token-Ring	NP	384K-512K	Wordstar	Wordstar	100+ printers	No	Yes	Inset Pic	Eight newspaper columns, hyphenation, auto-reformatting, footnotes	Crop, rotate, scale, update	$495
Molecular Design Ltd. (414) 898-1313	Chemtext	IBM PC, AT, PS/2 and compatibles	3+, Ethernet	Yes	NP	Any that produce ASCII text and DCA files	Any that produce ASCII text files and DCA files	Laserjet, any Postscript-compatible	No	No	HPGL, MDL Molfile	Hidden notes, mathematical formula editing	Page preview, chemical structure drawing	$500 to $1,500
NBI, Inc. (800) 922-8828	Legend	Ibm, 286 or 386-based PC and compatibles	Ethernet, IBM Token-Ring, SBT Multinet, Microsoft MS-Net	Yes	640K	NBI, Oasys, Wordperfect, Microsoft Word, DCA formats	Internal	Postscript-compatible	Yes	Yes	PCX, TIFF, HPGL, Macpaint files	Auto/manual kerning, style sheets, 32 snaking columns per page, table editor	Crop and scale, group and ungroup, movement alignment	$695
	Officeworks	NBI 500 Series Unix-based minicomputers	Ethernet, IBM Token-Ring	Yes	40M	Any that run MS-DOS, Macintosh operating system or Unix V.3 or Unix4.2	Internal	Epson FX-80, Diablo 630 HP Laserjet, any Postscript-compatible	Yes	Yes	Editor-dependent	NP	NP	$31,700
Networked Picture Systems (408) 748-1677	Page Express	Any 80386-based system	Novell Advanced Netware	Yes	NP	All	Proprietary	Scitex, Crosfield, thermal printers, IRIS	Yes	Yes	TIFF, Bitmap	Kerning, hyphenation, gencodes, drop cap	Color manipulation, image rotate, mask	$6,995
Northlake Software, Inc. (503) 228-3383	Tex/Latex/-Imprint	DEC VAX/VMS	DEC Vaxcluster	No	NP	NP	VMS text editors	DEC LNO3, Compugraphic 8400/8600, Imagen laser printer	No	No	NP	Hyphenation, auto-index and cross references, justification	None	$200 to $1,200
Phasephic Systems, Inc. (312) 505-0016	Pagework	286- and 386-based systems	Netware, Ethernet	Yes	512K	Any that produce ASCII text files	Any that produce ASCII text files	Any Postscript-compatible, Laserjet, thermal printers	NP	Yes	CGM, DXF, Targa, WKS[17]	Auto-column, run around, multipage text spill	Crop, scale	NP
Penta Systems International, Inc. (201) 244-0050	Textmaster	Data General MV, IBM PC, XT, AT	Ethernet, Thinwire Ethernet Starlan	Yes	8M	DEC CEO, Xywrite, Wordperfect, Wang	Editmaster	Postscript, all typesetters	Yes	Yes	PCX, TIFF, Bitmap	Hyphenation, justification, tabulation, kerning, page makeup	Crop, scale, flop, rotate	$38,995 (includes hardware)
Pressoft (818) 785-4444	Fontasy	IBM PC, XT, AT and compatibles	None	Yes	NP	Any that produce ASCII text files	Internal	NP	No	Yes	TIFF	Auto-column	NP	$129
Quark, Inc (800) 356-9363	Quarkxpress	Macintosh SE, II	None	Yes	1M	Microsoft Word, Works, Macwrite, Wordperfect, Writenow, ragged text files	Any that produce ASCII text files	Postscript, Quickdraw, Imagewriter	Yes	Yes	TIFF, RIFF, EPS, Pict, Pict 2, Bitmap	Kerning, auto-text flow from column to column and page to page	Wrap, custom contrast control, scale, crop	$795
Savtek Corp. (617) 891-0838	ETG Plus	IBM PC, XT, AT, PS/2 and compatibles	Netware	Yes	NP	Any that produce ASCII text files	Any that produce ASCII text files	More than 150 printers	Yes	Yes	ETG[18]	Text floatation, semi-automatic hyphenation	Variable size, rotate, flip, zoom, box	$89.95
Scenicsoft, Inc. (800) 422-2994	Scenicwriter	IBM PC, XT, AT, PS/2	None	No	384K	Any that produce ASCII text files	Any that produce ASCII text files	Laserjet, Postscript-compatible	Yes	No	PCX, TIFF, EPS	NP	Half-tone gray, smooth, sharpen	$695 to $1,495

COMPANY	PRODUCT NAME	HARDWARE SUPPORTED	NETWORK COMPATIBILITIES	MENU-DRIVEN	MEMORY REQUIRED (IN BYTES)	WORD PROCESSING SOFTWARE SUPPORTED	TEXT EDITORS SUPPORTED	SCANNERS SUPPORTED	OUTPUT DEVICES SUPPORTED	WYSIWYG! CAPABILITIES	GRAPHICS FORMAT STANDARDS SUPPORTED	TEXT MANIPULATION OPTIONS	IMAGE MANIPULATION OPTIONS	PRICE
Scitex (617) 275-5150	Visionary	Macintosh	Tops	Yes	8M	Any that produce ASCII text files	Xpress	Mitsubishi color thermal printer	Yes	Yes	Pict, TIFF, Handshake	Style sheets, auto-hernia, hyphenation, justification	Scale, fit n window, rotate	NP
Scribe Systems, Inc. (412) 281-5959	Scribe Document Production Software	Domain, Aegis; DEC VAX, Microvax; IBM RT PC, 3030, 3080, 3090, 4300	NP	Yes	1.5M	NA	All	Apollo, Apple, Computgraphic, Datapoducts, DEC, Imagen, QMS, Talaris, TI, Xerox, all Postscript-compatible	No	No	PCX, TIFF, GDDM, Bitmap	Auto-numbering, indexes, cross references, auto-table generation	Resize; rotate	$4,000 to $16,000
Softquad, Inc. (416) 963-8337	Softquad Publishing Software 2.9	Any running Unix, Xenix, MS-DOS	Unix	No	1M	None	All	Postscript-compatible, Impress, Laserjet	No	No	EPS	Kerning, hyphenation, controlled page breaks, auto-column creation	None	$695 to $7,500
Software Publishing Corp. (415) 962-8910	Professional Write 2.0	IBM PC, XT, AT, PS/2 and compatibles	Advanced Netware, 3+, IBM Token-Ring, PC LAN	Yes	512K	Microsoft Word, Multimate, Multimate Advantage, PFS Write, Wordperfect, Wordstar	NP	Laserjet, Epson, NEC, Tandy, Okidata, Panasonic, Toshiba, Xerox, any Postscript-compatible	No	No	NA	Multiple fonts, auto-list format, table editing	NA	$199
Synaptic Micro Solutions (800) 526-6547	3B2: The Computer-Aided Publisher	IBM PC AT or compatible, DEC VAX	Advanced Netware, IBM PC Network	Yes	NP	Microsoft Word, Wordperfect, Wordstar, Sprint	Any that produce ASCII text files	Laserjet, Series II, Canon, any Postscript-compatible, IBM 8514, Viking, Wyse	Yes	Yes	PCX, TIFF, GEM, Bitmap, DXF	Kerning, auto-hyphenation, scale text, run text around graphics	Scale and rotate graphics	$1,900
Syntactics Corp. (800) 626-6400	Crystal Document Management System, Crystallaser	HP 9000/800, NCR Tower, Pyramid 900, Unisys 5000, Toshiba TS100, Sequent B and S, Altos, IBM RT*	No	No	640K-2M	Internal	Internal	Laserjet, any Postscript-compatible	No	No	Bitmap	Auto-hyphenation, making and parallel columns, auto-hernia, leading and justification	NA	$445 to $795
Talaris Systems, Inc. (619) 587-0787	Qdrive	Any DEC running VAX/VMS	Decnet	Yes	NP	Mass-11, Word-11, Wordmarc, Wordperfect, Scribe, Tex and Diable files	Any that produce ASCII text files	Talaris laser printers	No	No	Bitmap, Quic, Tek 4014, Raster	Page layout, font selections, page overlays	Scale, position, rotation	$2,900
Unison World, a division of Kyocera Unison (415) 748-6938	News Master II	IBM PC, XT, AT, PS/2 and compatibles	Advanced Netware, 3+	No	384K	ASCII text files	ASCII text files	Dot matrix, Laserjet-compatible	Yes	Yes	NA	Auto-column creation, left right and center justification	Horizontal and vertical slip, crop, resize	$79.95
Xerox Corp. (800) 832-6979	Xerox Ventura Publisher	IBM PC, XT, AT, PS/2 and compatibles	3+, Advanced Netware, IBM PC Net	Yes	640K	Microsoft Word, Multimate Advantage II, Windows Write, Wordperfect, Wordstar, Xywrite, Writer	Same as word processing software	Laserwriter, Epson dot matrix, Laserjet, Proprinter, IBM 4216, Xerox 4020, 4045, NEC, Toshiba, any Postscript-compatible	Yes	Yes	GEM, HPGL, DXF, PCX, TIFF	Cut, copy, paste edit text, hernia	Scale, crop, half-tone controls	$595 to $895

Interview

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become compatible with all the standards that drive the process.

In the future, the only thing specialized about image processing will be the software-based capability to control, manipulate and manage large-volume text, image and numeric databases in an efficient fashion. The rest of the components will be standard.

There will be some big database management problems that will have to be tackled, but image processing won't be the specialized problem domain that it has been in the past.

What kind of database management problems are you talking about?

The size of the textual streams and the size of the image streams are so big that you can't effectively get things back. It's a new game, and we'll have to develop a whole new set of paradigms to deal with it.

This sounds like something that is logical and economical only at a certain level of need.

I agree with you, but that is today. Tomorrow, I look at it differently. The reason I say that is that tomorrow, as information basically becomes electronic, then the need for high-volume archivable storage just becomes an automatic offshoot. I'm going to have these electronic databases in most corporations, whether I like it or not, just by the fact that I am going to do corporate publishing. So in the future, it is a question of volume.

And the neat thing is when we do go this route, then the actual cost goes down because you won't have all the special hardware for format translation. You can use your network throughout your company and have things accessible.

Are we talking about significant savings here? Enough to make cost a deciding factor?

Well, I guess I think the dynamics are a little different. I think there will be cost savings, but the cost savings get down to the fact that volume storage is going to get cheaper and cheaper.

Still, I can't imagine that every corporation would really have a need for such massive electronic document archives.

Actually, that is true. There may be a class of people for whom that will not be necessary. There are several scanners capable of doing this now and a lot more in development.

When would you expect that we might see some real merger between the two technologies?

It is hard to say exactly when that will occur. It could occur tomorrow morning or in four or five years. All that I can say for sure is that it will occur.

My guess, however, is that it will evolve, rather than happening suddenly and dramatically.

Why do you say that?

I've talked to a number of the people who are players in the image processing market, and I'm not sure they recognize the potential.

Is the situation similar among corporate electronic publishing vendors?

To a certain extent, yes. You have to separate the people who are selling composition and pagination systems from larger corporations such as DEC, IBM and Xerox. For the smaller ones, it is not so much a lack of vision as a lack of resources.

When you go to IBM and DEC, on the other hand, or Sun and Apple, you run into a different situation. I believe they do see this as the way of the future.

Do you think the real catalyst for what we've been talking about is going to be the read-write CD-ROM?

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IBM: The 4216 laser printer may now be shared in a local-area network. This month, IBM will unveil a maintenance release of the IBM Personal Pageprinter Adapter Program, which will allow printer sharing by multiple PS/2s, Personal Computer ATs and XT 286s.

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So your users want a PIM

The whys and wherefores of choosing personal information managers

BY ALAN RADDING

Comdex may be the ultimate metaphor for the information industry, encompassing both the great promise and overwhelming burden of information systems: There is so much information that one person cannot assimilate it.

Adam Rostoker appreciates, better than most, the overwhelming amount of information that surrounds the Comdex exhibition and conference. Last year, Rostoker worked for The Interface Group, Inc., which runs the show. As conference manager for the spring event, he had to juggle the needs and demands of the exhibitors, visitors and show managers. He had to concern himself with everything from the trivial to the momentous.

Managing Comdex is enough to drive anyone slightly crazy. So to cope with the incessant flood of information, Rostoker turned to his Intel Corp. 80286-based NEC Corp. personal computer and a new category of software called personal information managers (PIM).

The particular PIM that Rostoker used was Info-XL from Valor Software in San Jose, Calif. "I handled all of Comdex last spring with Info-XL and word processing software," says Rostoker, who is now the executive director of the Windows/Presentation Manager Association.

During Comdex, with the help of Info-XL, Rostoker says he was able to keep track of the endless number of people, projects, due dates, meetings, deadlines and varied bits of constantly changing information that is required to mount the giant trade show.

Today, in his new position, Rostoker uses another product — a Microsoft Corp. Windows-based PIM called Packrat from Polaris Software in Escondido, Calif.

Radding is a Boston-based author specializing in business and technology.

From soup to nuts

Like running a large trade show, managing a United Way campaign within a large organization is a chore that can drive even the hardiest manager a little bit nuts.

But after doing such a good job of organizing the United Way effort in his division last year, Robert Rubin, vice-president of MIS at Pennwalt Corp. in Philadelphia, was rewarded with the task of doing the same thing in 1988 throughout the entire company, an international chemical firm with $1 billion in sales.

Rubin turned to another PIM, Grandview from Symantec Corp. in Mountain View, Calif., to help him with his return to the United Way drive. "I wasn't going to use it simply [for] a general to-do list or anything like that. I used Grandview as a strategic tool," he explains.

With the product, Rubin found he was able to pull together the bits and pieces of reports and documents that he and others had previously developed.

Next, he combined that information with more recent in-house memos and database documentation to create the documents that detailed the strategy for the latest campaign. He then circulated the resulting strategic plan to other senior company executives for action and feedback, which was incorporated, via Grandview, into the next iteration of the strategy.

Yellow sticky-note deluge

Today, people are inundated with information. The flood, driven in large part by computer systems, overburdens the conventional methods people have long used to manage the everyday flow of information. Desks are now cluttered with lists on yellow-lined sheets of paper, brief notes stuck all over the telephone, clippings, calendars obliterated by meetings scheduled and changed repeatedly and reports piled on top of each other.

To deal with the ever-growing problem, PC users are, indeed, turning to PIMs.

"Personal information managers are the first products specifically designed to solve a problem that computers created — information overload. We can create it faster than we can assimilate it," claims Valor Software's Steve Sando, the developer of Info-XL, in a research paper on the general subject of PIMs.

Complicating the job of information management is the fact that people absorb their information in so many different forms simultaneously. Rarely does an individual work only with text or numbers or neatly structured files.

"We all have lots of different information: lists, documents, spreadsheets, notes. That's always been the problem," says Jeffrey Tarter, publisher of the "Softletter" newsletter in Cambridge, Mass. "When we're involved in a project, we use it all."

If you need to manage numerical data, there is the spreadsheet. If you work with text, there are word processors and outliners. For structured data, there are a range of database products from simple file managers to full-powered relational databases. Each category of software manages one type of information. "So far, all we've really done is automate the pieces," Tarter notes.

Even integrated software products that provide the smooth flow of data from one application to another do not fully solve the issue of multiple types of data.

"The user needs to relate letters, memos, notes, names, companies, topics and dates. Integrating applications provides only a very small portion of the answer," Sando writes. Users still must make the connections

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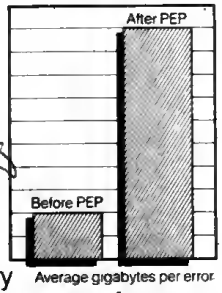

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between different types of data. He points out that instead of integrating applications, the emphasis must be on integrating data.

Personal information managers are an attempt to automate and integrate the entire flow of data. The software accepts data in any form from any source and allows users to access that data in whichever ways they choose. The PIM, with minimal input from the user, automatically structures the data.

Surging interest

A sudden surge of public interest in PIMs developed last year as the first fully functional PIM products — such as Lotus Development Corp.'s Agenda, Dayflo Software Corp.'s Dayflo Tracker and Info-XL — appeared. "These [types of] products transcend the traditional boundaries" between existing software categories, Tarter notes.

Until the advent of PIMs, users were forced to "interface with the computer in a flawed manner," Rostoker claims. Users tried to force their particular problems into the structure of whatever application they were most comfortable with, such as the spreadsheet or a database.

Pennwalt's Rubin

"PIMs break through that barrier," Rostoker continues. "They are more task oriented." With a PIM, the goal is managing information rather than creating a database or a spreadsheet.

Predecessors to the current PIMs have been available for some time.

Programs such as Borland International's Sidekick, Asksam Systems, Inc.'s Asksam and a variety of other products offer limited PIM-like capabilities.

"There are a host of products to manage the notes that accumulate," Tarter says, but these products all lack the cross-referencing capabilities that are the essence of a true personal information manager.

PIMs, ideally, are software products that allow the user to input information of any size and type from any source and then extract portions of that information in any sequence, depending on connections either the user or the system has made.

Personal information managers provide the ability to store, retrieve and sort any data to allow the user to draw inferences and make connections that were not explicit at the time of the data's entry.

For instance, the same information entered randomly from a variety of sources concerning people, dates, projects, meetings, significant data, financial projections and competitive reports can be returned by the PIM as a prioritized list of things to do, a project timetable, a profile of an individual's activities or progress, a marketing analysis, a sales forecast or something else, depending on how the user wants to view the information.

What they're not

PIMs are not likely to replace spreadsheets, databases or word processors, although various PIM products have strong elements of those applications. Instead, the current expectation is that information managers will share the computer with one or two of those other primary applications and be used in conjunction with them.

For instance, databases are best for dealing with large quantities of highly structured, relatively static data, but they are "too structured to use to synthesize changing data," explains Andrew Hammond, product marketing manager for Lotus's Agenda, one of the industry's leading personal information managers.

Word processors were designed primarily to create data, not organize and retrieve it. So, too, outliners do not have the power to do much more than duplicate what users already do on a notepad.

Spreadsheets, in some ways, are closest to PIMs, because the spreadsheet gives the user the capability to relate one piece of data to another and change the data and relationships at will. Unfortunately, spreadsheets can only exercise those capabilities on numbers for quantitative analysis.

"AGENDA, Grandview and Ize are the biggest sellers."

LOU LEVINE
CORPORATE SOFTWARE

The most likely scenario for the widespread use of PIMs is that they will exist in a synergistic relationship with the current popular applications.

Most PIMs provide the capability to import spreadsheet, word processing and database files into the PIM. The more sophisticated information managers, such as Persoft, Inc.'s Ize, offer macro-like capabilities, called hot links, which will automatically retrieve data from outside sources.

Hammond says he sees the spreadsheet and the personal information manager operating in a left-brain/right-brain scenario, depending on whether the user's immediate need is for strict numerical analysis or for a broader, more intuitive view.

PIMs are directly related to the concept of hypertext. Essentially, hypertext refers to the interconnection of static information in nonlinear or unstructured ways.

"Hypertext creates a network of links so that you can traverse information in a variety of ways," explains Persoft Chairman Ed Harris.

Hypertext programs basically rely on multiple keywords to identify each item of information. A basic fact can be tagged

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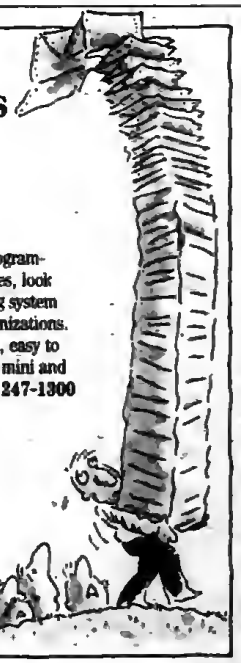

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with a keyword designating its subject area, its source, its time- and date-stamp or anything at all. The user can then turn to a keyword or combination of keywords to view what otherwise appear to be unrelated items.

Hypertext is not a new idea; it has been kicking around the mainframe industry for several decades. The technology got a big boost, however, with Apple Computer, Inc.'s introduction of Hypercard in 1987.

While Hypercard utilizes hypertext, it is not a PIM in the way that Agenda, Info-XL, Grandview, Dayflo Tracker or a growing number of other offerings that have come to define the category are. Hypercard is more like an unstructured database that allows the user to create hypertext links between elements in the database.

"TWO OF Info-XL's biggest markets are detectives — the FBI — and ministers."

JEFFREY TARTER
"SOFTLETTER"

But it is the hypertext qualities of PIMs, along with other advanced features such as rudimentary artificial intelligence, that separate the new products from their predecessors.

"The first generation of information managers simply presented users with a linear list," Harris notes. Users got from the program only what they put into it, in generally the same form. The latest generation of PIMs, however, has added intelligence, which allows the programs to automatically reorganize and restructure the information, resulting in unanticipated connections, he adds.

Leaders of the pack

Although it is still too early to rank PIM products by market share and sales, several products have emerged as the leaders of the pack. "With a $6 million advertising budget, Agenda is really defining the category. It is our biggest seller," says Lou Levine, product manager at Corporate Software, Inc., a Westwood, Mass., software distributor specializing in corporate sales.

Other major players at this early point include Ize, Grandview and Info-XL. A number of others, such as Dayflo Tracker, Conductor Software, Inc.'s Act, Asksam and Microlytics, Inc.'s Gofer may also be regarded as PIMs, but these products have not caught on the way that the market leaders have. "Agenda, Grandview and Ize are the biggest sellers," Levine notes.

Ironically, the three leading offerings are the least alike, and in some sectors, Grandview and Ize may have trouble qualifying strictly as personal information managers. "Ize came out of text-based retrieval systems, and we added innovations like keyword outlining and hot links," Persoft's Harris says.

Grandview is more correctly termed an outliner, the direct descendent of Symantec's Think Tank. Products such as Dayflo Tracker, which relies heavily on a forms approach, and Act, which is highly structured for the sales environment, may also be categorized as personal information managers, but analysts see them filling more specialized niches. "They do a better job for some particular problems, but they are not really general purpose," Tarter says.

What do general-purpose information managers do? Although project management is considered a key task for PIM applications, the programs are not comparable with formal project management software. "PIMs are used to manage a mass of information, but not in the structured way classic project managers do," Tarter points out.

PIMs are "terrific for project planning, but not project management," says Gary Josie, executive vice-president of Valor Software. By project planning, Josie means the events leading up to the formal start of the project.

Project management, on the other hand, refers to critical-path scheduling and other formal project management activities, according to Josie.

And who would use an information manager? In many cases, the first PIM users are the corporate users who already use spreadsheets, databases and word processors. "Our customer is probably a manager in a group with several people to oversee and maybe several different projects going on," Josie says. Analysts and marketers, however, suggest that eventually the products could attract broad classes of new users to personal computing.

"Two of Info-XL's biggest markets are detectives — the FBI — and ministers," Tarter reports. "Neither of these two jobs are traditionally computerized." Ministers are reportedly using the program to manage varied information about their congregations, whereas the detectives, presumably, are using the program to sort through the piles of information that they accumulate in the course of an investigation.

The marketers hope that new users will be drawn to the PIMs, thus expanding the universe of desktop computer users, but that has not happened yet in any large sense.

Rostoker points out that there are two old computer problems that still must be overcome if PIMs are to attract large numbers of new computer users.

First, there is the problem of keying in data, and second, there is the more basic problem of access to a computer. If a person does not have regular access to a computer or is not willing to key in data, a PIM will not be helpful.

Coopers & Lybrand's Talamo

Peter Piper picked a PIM

Picking a PIM, at least until the category becomes cluttered with me-too programs, is relatively easy, because there are clear differences between the programs. Each PIM comes from a different prototype and takes a slightly different approach to the problem of information management; therefore, each product is better suited for some tasks than others.

Agenda comes very close to Lotus's 1-2-3 metaphor and comes out of the need to manage people and projects. Ize arose from text retrieval. Dayflo Tracker comes from filling blanks in forms. As a result, each product offers its own strengths and appeals. "I use Grandview. I love its outlining," Harris admits. Agenda is better than Ize for managing a project, he adds, but Ize cannot be matched when it comes to managing large amounts of data.

The Ize have it

Bob Didner, senior staff consultant at Dun & Bradstreet, Inc., in Berkeley Heights, N.J., presents a classic example of what Ize can do. He spends most of his time researching and writing reports. For these projects, he might download several hundred abstracts from on-line information services like Dialog.

Rather than wading through all the information piece by piece, Didner uses keywords through Ize to catalog and classify the massive amount of information. The program will then automatically outline all the data in hundreds of abstracts.

Before he had Ize, he manually outlined his projects, put data on individual cards and then physically arranged the information. "I had scraps of paper all over. I had Dialog printed out on paper. It was only sequential," Didner recalls. "Then I would use an outliner, but it was too constraining." With Ize, he can generate tremendous amounts of material without regard to structure and organize it later.

Mary Dolce, by comparison, is a typical Agenda user. As a systems consultant at Baxter Healthcare Corp. in Deerfield, Ill., and the president of the Chicago Computer Society, Dolce must keep track of many small pieces of information, some of which relate to her clients and some of which relate to the computer society. Before she had Agenda, she "would write a lot of notes and then lose them," she says.

"I CAN'T SEE MIS worrying about how people keep their personal phonebooks."

LESLIE FIERING
BANKERS TRUST

Agenda is particularly valuable to Dolce, she claims, because most of her material is very short and much of it is date-specific. "I have to track 20 computer society meetings each month and keep up with the volunteers," she explains.

Dolce says she also considered Ize but rejected it because it was too text-oriented. Agenda, however, allows her to enter her short pieces of data in a free-form fashion and then structure it later. Agenda automatically tracks dating, even with indirect references such as "next week."

Grandview and Info-XL come to information management through the outline metaphor. "If you are looking for something to help you organize and present information, then that's Grandview. If you want something that will discover hidden relations between things, then you probably want another product," says Pennwalt's Rubin.

Like the spreadsheet before it, the PIM is making its way into the corporate environment as a small grass-roots movement. "The more proactive users are starting to talk about Agenda," says Leslie Fiering, assistant vice-president of advanced technology at Bankers Trust Co. in New York.

And, prodded by executive interest, Virginia Talamo, microcomputer technologies manager at Coopers & Lybrand in New York, is starting PIM demonstrations and beginning the new software evaluation process.

While it is too early to tell if one of the current products will succeed as the corporate standard, early betting is on Lotus' Agenda, which can ride on the coattails of 1-2-3 — a product that is already pervasive throughout the corporate environment.

Fiering predicts that organizations will eventually enforce a flexible standard with regard to PIMs. "To the extent that you need to standardize to receive the economies of scale, there will be a corporate standard," she says. That particular standard will be enforced more through the availability of support, templates and macros rather than by corporate command. "I can't see MIS worrying [about] how people keep their personal phonebooks," she concludes.

Corporate PIMheads

The key to acceptance in the corporate environment is the rise of personal information manager power users, which Rostoker calls "PIMheads." The power users will develop the templates, macros and various structures needed to pull out information. These structures will become standard within each organization, much the way 1-2-3 macros have.

To speed the process, the major marketers are touting add-on products that will give users immediate access to effective structures for specific applications.

Indeed, a marketing battle is building for dominance of the PIM arena, which the manufacturers regard as potentially as large as the spreadsheet niche. "Lotus is starting to dominate, and if the trend continues, Agenda will probably become the main product," Corporate Software's Levine says, "although from a function standpoint, that shouldn't be the case."

Other industry observers suggest that one PIM will never dominate because user needs are too varied for one product to effectively fit all users. "There will be four or five dominant PIMs because people will use different products for different reasons," predicts Dayflo President Bob Gilchrist. Like word processing, as many as a half-dozen preferred products will coexist at the top of the market without a clear-cut leader, he says.

While it is too early to predict whether personal information managers will develop into a standard analytical tool and become as pervasive as spreadsheets, the category is destined to quickly find its way into public consciousness: Agenda even plays a key role in the newly released movie "The January Man."

In the film, a hot-shot, high-tech detective uses Agenda to solve a crime. Lotus is hoping that "The January Man" will popularize PIMs and Agenda in much the same way that the movie "War Games" glamorized computer hacking. •

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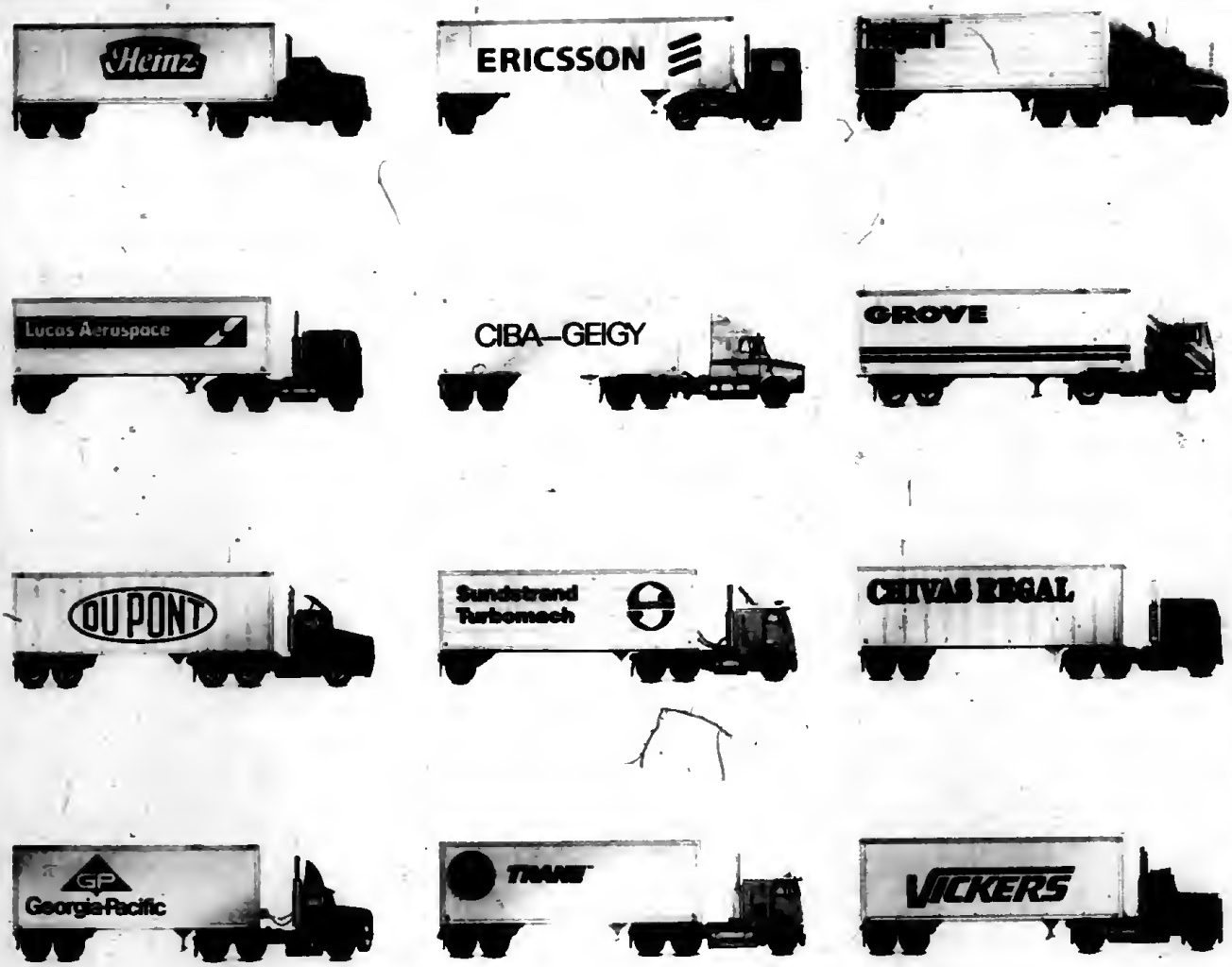

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MANAGEMENT

TAKING CHARGE

Alan J. Ryan

Pulling down the grapevine

The California Raisins have become famous singing about what they've heard through the grapevine — namely, that raisins grown in the California sunshine are better than any others.

Those cute, animated clay figures singing and snapping their tiny gloved fingers are the epitome of television advertising. They bespeak sincerity. They charm children into demanding "Raisins from California only, Mom."

But picture this. Bring those plump raisins into the MIS department of Joe's Huge Nationwide Claymation Advertising Co. and give them all the information they need to know about doing their jobs. But neglect to pass along any information about important corporate issues that could affect them.

Soon, the uninformed raisins will be considered little, wrinkled, dried-out grape gossipmongers, because as they start to hear tidbits of information, it is likely they will in turn pass it along. Tales of mergers, takeovers, promotions, demotions, new hires, layoffs, profits, losses, percentage raises, safety concerns and the like will be on the lips of every raisin venturing to the water cooler.

Now, put the faces of your subordinates and coworkers on those raisins, and you can get an idea of how the lack of information can be more damaging than telling employees some news that might adversely or positively impact them in the future.

Knowing that the uninformed can do a lot of damage through the rumor mill, especially when the rumors are unfounded, many companies are now fighting back. Negative rumors are like negative advertising for the company.

At MCI Communications Corp. in Washington, D.C., for example, the firm tells of an ongoing active effort to shower the firm with accurate information straight from the top. Each Monday, executives meet to discuss the business, and that informa-

Continued on page 84

MIS takes the field

Connolly puts together Meadowlands operation

BY STANLEY GIBSON
CW STAFF

In the mid-1970s, the outlandish idea of filling in a New Jersey salt marsh with sand dredged from New York Harbor and thereupon building a football stadium became reality.

Giants Stadium at New Jersey's Meadowlands was a bold declaration of that state's independence from its larger neighbor, New York. Over the years, the complex grew by adding the Meadowlands race track and the indoor Brendan Byrne Arena.

In contrast to the grand scale of the buildings, information management at the Meadowlands was at first an ad hoc affair; organization was sparse, and paper ruled. But the need to gain control over strategic information was irresistible.

"We did so many things manually, people realized there had to be a better way," says Gerry Connolly, MIS director at the New Jersey Sports and Exposition Authority, which operates the Meadowlands in East Rutherford, N.J., Monmouth Park Racetrack and an aquarium under construction in Camden, N.J.

Two years ago, Connolly, a 16-year MIS veteran, came to the Meadowlands to bring order to its MIS shop. Just as the complex was a pioneering effort for New Jersey, so the 43-year-old Connolly had to carve out an efficient MIS operation. The tools he inherited were a recently purchased Unisys Corp. Mapper 10 system and a handful of personal computers.

Calculating the costs

His mandate is to improve the Meadowlands' profitability by making information on the costs of running events available to management. Connolly feeds data on receipts and expenses to his boss, Chief Financial Officer James Durkin.

"I want efficient daily and monthly information," says Durkin, who sees that the authority, as landlord of the complex, turns a profit. In 1987, the authority earned $46.5 million.

The MIS shop's responsibility does not extend to tallying wagers at the racetrack, which is done by a service bureau, and the finances of the Meadowlands' sports teams — the New York Giants, New York Jets, New Jersey Nets and New Jersey Devils. These tenants are responsible for their own computing.

Carrying out his assignment, Connolly proceeded to build on what was available. He used Mapper, Unisys' fourth-generation language, to develop applications quickly and added an infusion of PCs to make office employees more productive.

Continued on page 85

PROFILE

Gerry Connolly

JOHN MACTIN

Position: *MIS director, New Jersey Sports and Exposition Authority*
Mission: *To provide better information to manage the complex's events*

Adventures in tech implementation

BY ALAN J. RYAN
CW STAFF

CAMBRIDGE, Mass. — It all looks good on paper. But when the time comes to actually implement CASE tools, executive information systems and expert systems, the best advice those who have been through it can offer is to keep it simple, do not get in over your head and enlist the help of users.

When Frank Morelli, associate director of expert systems at Colgate-Palmolive Co. in New York, was called upon to evaluate knowledge-based systems (KBS), he formed a group of users to discuss which areas of the company would be suited to such a system. Then he built his test system around an actual in-house problem using a personal computer-based expert system shell.

At one time, the MIS group at Fidelity Investments in Boston was little more than a maintenance shop, said Claire McGhee, who was formerly the director of systems planning there. When the group decided to start developing computer-aided software engineering (CASE) applications, they found the greatest success when they placed a high value on people and set reasonable goals rather than lofty ones.

And when a president at The New England, a Boston-based insurance and financial services firm, decided he needed help wading through the scads of reports that crossed his desk, he talked to the systems people.

After a couple of failed mainframe-based program attempts, he finally got what he had asked for through a relatively simple PC executive information system (EIS) designed with the help of users, Vice-President Vince Ficcaglia said. That system has since made its way onto many other desks at The New England.

People are solving real problems using technologies that many firms still shy away from. With the support of management and careful legwork, CASE, KBS and EIS can make important inroads, those exploring the technologies told attendees at last month's annual Conference on Strategic Issues in Managing Information Technology, which is sponsored by Decision Support Technology, Inc.

Insider insight

To have a successful development effort, a relatively stable staff is important, McGhee said: "If you have high attrition, the training investment does not make much sense." A stable development environment also consists of two-way communications between management and staff, high quality and stable physical facilities, she said.

Most developers are tempted to jump feet-first into a project once they have been given the go-ahead. Instead, it is important to carefully define what the end results should be. "Rather than have technology drive the solution, it was just a part. We defined the need, and technology contributed to the solution," Ficcaglia said.

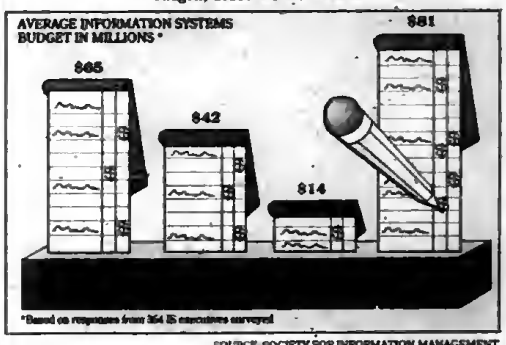
Next, be certain that all of the necessary tools and training are in place before starting. Many companies make the mistake of taking the "fire, ready, aim" approach, trying to implement too many changes too fast and mistaking tools and technology for solutions, McGhee said. Others run into trouble when they implement systems that are out of synch with the company culture.

Continued on page 84

Data View

IS budget highs and lows

Government organizations have the largest information systems budgets; academia the smallest



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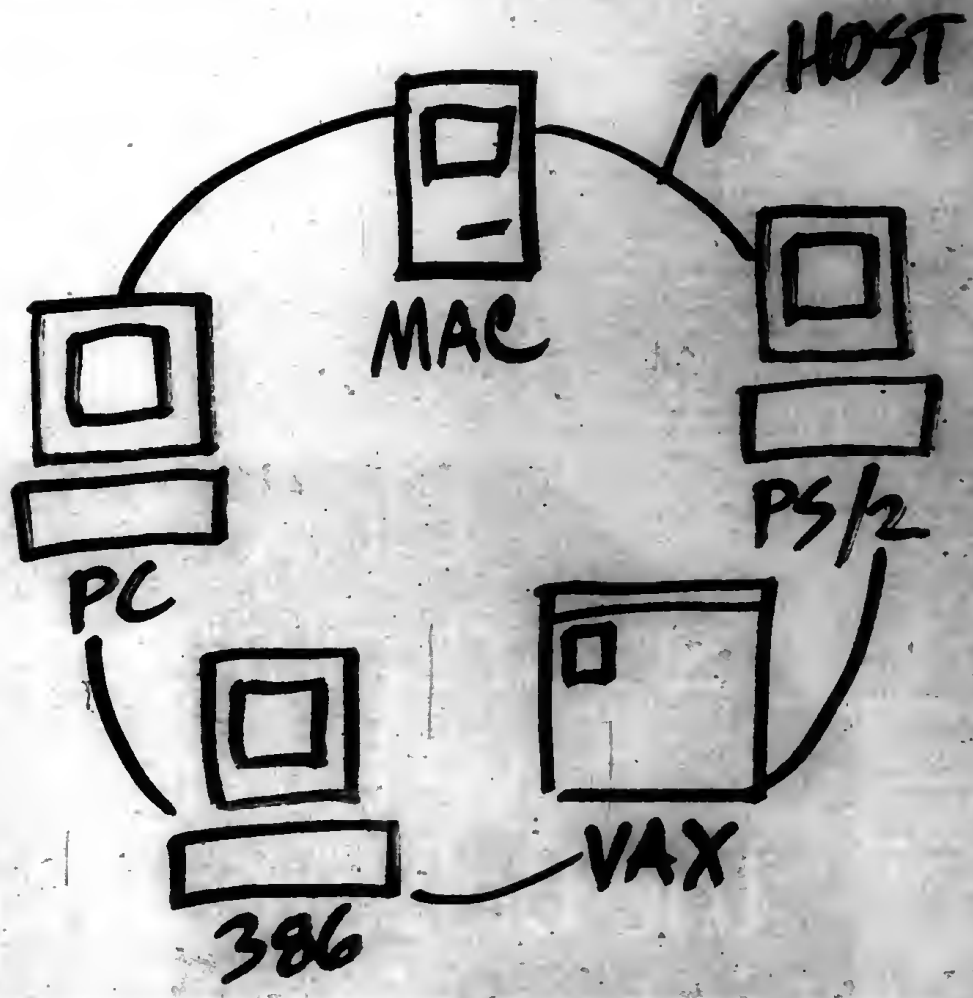

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Army's ISC may head East

The management of one of the world's largest MIS organizations will be shifting from Arizona to Massachusetts if the U.S. Congress approves a federal commission's proposals for the reorganization of U.S. military bases.

The U.S. Army Information Systems Command (ISC), headed by Lt. Gen. Thurman D. Rodgers, is slated to shift from Fort Huachuca, Ariz., to Fort Devens, Mass. The overall plan is to reorganize or close 145 military facilities by 1995. The ISC oversees systems development and operations, communications, printing, television facilities and records management at Army sites throughout the world and employs 42,000 people.

Under the plan, 1,156 military personnel and 2,784 civilian jobs will shift to Fort Devens. Personnel will come from Arizona and the consolidation of three ISC organizations now headquartered at the Information Software Center in Fort Belvoir, Va., the Information Systems Management Activity in Fort Monmouth, N.J., and the Software Development Center at Fort McPherson, Ga.

The Commission on Base Realignment and Closures offered few reasons for its suggestions. The panel said Fort Devens is well suited for a national command, which led to speculation that the officials want the command sited closer to Washington, D.C., and to the pool of computer-oriented talent in Massachusetts.

Ryan

CONTINUED FROM PAGE 81

tion is then passed along to the company's employees.

According to Bill McGowan, founder of MCI, the executive-level breakfast meetings are the place where rumors are stopped before they can be started. The managers, in turn, are told to spread the word to the masses.

Does it really work? McGowan says yes. "When people are aware of what is happening elsewhere in the company, they can better make decisions in their own areas," he says.

J. Raymond Caron, president of Cigna in Philadelphia, agrees. It is important to let employees know where the company is headed, he says, and how they fit into its direction: "We also have to let them know when we are not there and why we are not there. But it works both ways. We need to allow for the employees to let us know what works and what isn't working."

This certainly means more than sharing with employees the fact that the boss will be retiring in 1992. Strategic information should be shared. Employees will most likely perform better when they know what goals they are supposed to be striving toward. At the same time, care should be taken so that highly confidential information does not leak out.

By being straightforward, a manager will gain trust and respect from his employees. Ignorance is rarely blissful in business; more often than not it will lead to ambivalence from the workers.

Ryan is a *Computerworld* senior writer.

Adventures

CONTINUED FROM PAGE 81

Do your homework, she urged.

Part of that homework should involve talking to users to see what they might expect from a new system and to inform them of a system's limitations, Colgate's Morelli said.

The homework should also include a visit to a noncompetitor working on a similar project, the speakers said. And when you finally begin, start off small, if possible, and be sure to establish relevance; do not develop an expert system to solve a problem that could be effectively addressed with a spreadsheet.

It is also important to have a core of users supporting the efforts under way. "If you don't have a core of user champions, it is going to fail," Morelli said. The users' opinions are critical not only for creating a successful system but also for helping with the final product's acceptance.

To keep this continued support, be willing to show results at various phases of the project and do everything you can to have the project completed on time, the speakers advised.

A typical mistake that many companies make is postponing projects in the hope that the technology will be more fine-tuned and prices will drop soon, said David Ness, a professor at The Wharton School at the University of Pennsylvania and director of systems development at *TV Guide*.

While that approach is prudent in some instances, it can become habitual, he said. And the company that follows this practice will be missing out on new developments that, while not perfect, can achieve favorable results.

The speakers cautioned that projects such as EIS that are user-driven can cause friction with the traditional data processing group.

"Don't treat new technologies separate from traditional systems. They are just new tools in the information systems toolbox," Morelli advised.

Another important lesson, Ficcaglia added, is to be realistic. No system is a long-term answer. "Executive information systems have to be designed to expect and accept change," he said.

See us in booth #1552 at Communication Networks '89.

How smart planners have turned the Bell break-up into a significant strategic advantage:

Meadowlands

CONTINUED FROM PAGE 81

With an MIS staff of four, Connolly hired consultants to create approximately 10 programs in Mapper. The PC population grew from four to 40 in a year, and another 40 PCs are slated to be added in the next two years. Connolly's staff, meanwhile, doubled from four to eight.

The MIS department at the Meadowlands is housed in the authority's corporate offices on the ground level of Giants Stadium. Connolly, who had grown accustomed to a buttoned-down atmosphere in his prior MIS stints at Pepsico, Inc. and McGraw-Hill, Inc., is fascinated by the running of the facility that surrounds him and enjoys taking strolls around the stadium during breaks. However, he must be on guard for football players who may suddenly appear out of nowhere as they jog in the bowels of the stadium. It's not the typical 9-to-5 environment.

The Meadowlands' Unisys system was likewise new to the MIS director. Connolly, who began his career as a Cobol programmer, had always worked in IBM shops. But he credits the Mapper language with allowing him to bring up applications quickly and avoid a backlog.

Brian Gorman, systems administrator and assistant to Connolly, has also become a Mapper fan. "If you understand the application, you can program," he says. Gorman, who worked as a security guard at the complex as a student, was present for the opening of all three facilities.

On the PC front, Connolly made the decision to standardize on Ashton-Tate Corp.'s Multimate for word processing and Lotus Development Corp.'s 1-2-3 for spreadsheet work running on Microsoft Corp.'s MS-DOS. A typical activity is to perform what-if scenarios, plugging figures into spreadsheets to get cost estimates for events.

JOHN MARTINI

Connolly

The shop has also standardized on IBM-compatible PCs, primarily machines using the Intel Corp. 80286 microprocessor. The shop buys a number of different clones, but mainly NEC Corp. and Compaq Computer Corp. processors.

Some of the PCs equipped with terminal emulator boards are linked to the Mapper 10 host, from which they download corporate data for spreadsheet manipulation.

Although balancing income against operating expenses can be relatively simple for some events such as the routine Giants sellouts, the process can be complicated for others. The annual Meadowlands Grand Prix Auto Race was once a record-keeping nightmare.

The race course, which winds through the Meadowlands parking lot, must be laid out and lined with temporary barriers and grandstands. The cost of removing and replacing the barriers is significant. "You couldn't tell when you spent money. Now, on the computer, you can look at the information in detail or globally," Connolly says.

> "WE DID so many things manually, people realized there had to be a better way."
>
> GERRY CONNOLLY
> NEW JERSEY SPORTS AND EXPOSITION AUTHORITY

Another ongoing project is to use information systems to improve the racetrack's operations. A number of variables can affect racing attendance and betting take. For example, a snowstorm can cut attendance sharply. But if management knows how many hard-core racing enthusiasts are likely to brave foul weather, they can make sure the right amount of staff is on hand at the track.

In addition to keeping up with current goings-on, Connolly must look ahead to prospective events. Next year, Giants Stadium will host the Army-Navy football game, and the MIS department is busy figuring out its costs and revenue.

Further down the road, professional baseball could come to the Meadowlands, even though a recent proposal to build a baseball stadium was turned down by New Jersey voters.

The idea is not expected to die, however, and Connolly, an avid baseball fan, looks forward to the day when New Jersey, which only a few years ago hosted no major league sports, adds a baseball team to its roster.

Who's on the go?

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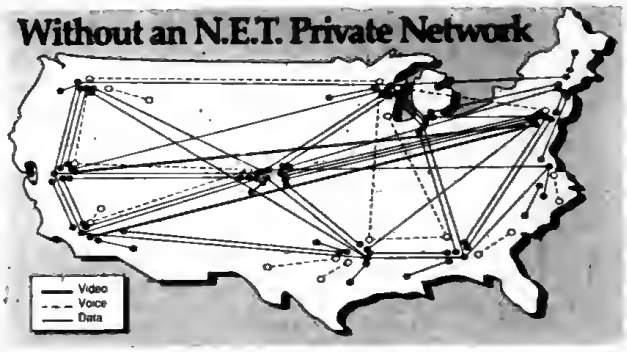
Private networks.



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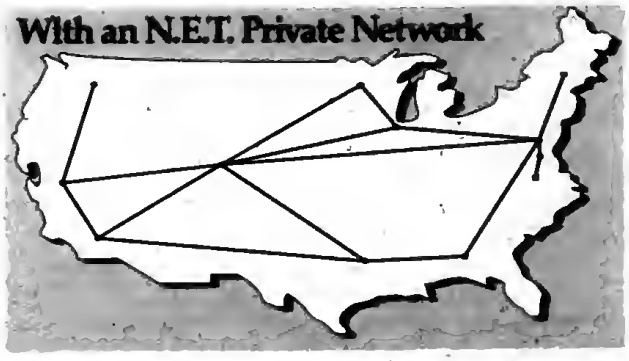

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INDUSTRY INSIGHT

Glenn Rifkin

DEC bungles nomenclature

If Yogi Berra was out in Littleton, Mass., last Tuesday, he might have muttered, "It's déja vu all over again." For those of us who've been in the business long enough, DEC's glitzy personal computer and workstation announcement last week seemed eerily like a similar big day DEC put on in May 1982.

On that day, a beaming Ken Olsen stood on a brightly lit stage in downtown Boston and introduced DEC's contribution to the PC wars — the Pro, the Rainbow and the Decmate II. He showed off the machines himself, holding up one of the monitors in his huge hand and declaring, "This set of products has created more enthusiasm, more excitement in the company than I've ever seen before."

Olsen boasted that the machines had "an architecture that should last and propagate forever" and completed his presentation by declaring, "My reac-

Continued on page 93

Battle on field in fourth quarter

Analysts predict tough yardage for minicomputer sector, laurels for IBM

BY NELL MARGOLIS
CW STAFF

Analysts last week predicted a computer industry fourth quarter marked by continued erosion of the traditional minicomputer market, heightened user expectations and an impending price war in the fast-track microcomputer sector and triumph for IBM.

The marketplace's move toward the desk top continues, noted Timothy McCollum, an analyst at Dean Witter Reynolds, Inc. McCollum predicted that the numbers coming from major personal computer and workstation vendors — Apple Computer, Inc., Compaq Computer Corp. and Sun Microsystems, Inc., for example — will be largely favorable.

Even in the relatively vital microcomputer sector, analysts expressed more conservative optimism than outright enthusiasm.

"Tandy Corp. didn't have a bad December quarter — not a great one, but not a bad one," said Richard Shaffer, president of Technologic Partners in New York. "It looks like a good quarter for Compaq, Apple, IBM; nothing should change that."

However, Shaffer cautioned, a microcomputer user community that is increasingly "more sophisticated, more demanding and more able to do something about it" is quickly creating a market that will not tolerate poor quality, poor service or poor price/performance.

Breather from buying

In addition, according to Redding, Conn.-based computer industry analyst Dale Kutnick, the microcomputer sector is undergoing egregious overcapacity at a time when large corporate customers are taking a breather from buying until prices come down even lower than they already are.

Continued on page 93

Data View

Top semiconductor makers of 1988

Japanese firms hold lead; Intel and Philips trade places

NEC	1	1
Toshiba	2	2
Hitachi	3	3
Motorola	4	4
Texas Instruments	5	5
Fujitsu	6	6
Intel	7	10
Mitsubishi	8	9
Matsushita	9	11
Philips-Signetics	10	7
National Semiconductor	11	8
Advanced Micro Devices	12	12

SOURCE: DATAQUEST INC
CW CHART: FRANK C. O'CONNELL

Inside

- Tandem will do desktop with AST Research PCs in $30M OEM deal. Page 88.
- Apollo calls on heavy hitter to revitalize marketing group. Page 9

SIA probes health hazards

CUPERTINO, Calif. — After preliminary results from a University of Massachusetts health study of wafer fabrication employees revealed a higher rate of miscarriages than for a similar group of nonwafer production employees, the Semiconductor Industry Association (SIA) recently pledged $3.5 million for its own research.

With participation from 18 chip producers and systems makers with captive semiconductor operations, the study will be conducted on an unspecified number of volunteers from plants nationwide. It will attempt to identify any problems so that companies can rectify them, an SIA spokeswoman said.

The Massachusetts study that triggered SIA interest was sponsored by Digital Equipment Corp. and examined 750 female semiconductor operations employees in 1986.

Chip production involves a variety of hazardous materials including solvents, arsine gas (arsenic) and heavy metals.

Among systems and communications equipment makers participating are AT&T, Northern Telecom, Inc., Hewlett-Packard Co. and DEC.

Techie preacher's pulling our plugs

BY J. A. SAVAGE
CW STAFF

St. $ilicon, a.k.a. Jeffrey Armstrong, is not seeking a flock of flakes. His Church of Heuristic Information Processing (CHIP) in Santa Cruz, Calif., is for the computer-literate only. The required audience response to his preaching is not "Amen" but "Enter."

"How many of you have ever lost data?" this curious high priest of high-tech asks his audience on the main street of Santa Cruz. "The church has something to sever your connection with it so the data can go on. It's Purge-atory. The gate to Purge-atory says 'Abort? Retry? Ignore?' "

St. $ilicon has been preaching to the technologically converted for nearly three years at users meetings, in board rooms and occasionally from the streets. Formerly Apple Computer, Inc.'s representative to the Middle East, Armstrong said he came to the strange occupation of computer humorist to help relate individuals immersed in computers to the historical and sociological meaning of our technological society.

"No matter what you do, the personal element is at peril in a rule-based system," he said.

St. $ilicon administers his inspiration from the Giver of Data, or god, to two branches of the church — Cathod-lics and Geek Orthodox. At the end of their religious teaching, his followers reach Nerd-vana.

"Being St. $ilicon is my way of atoning," $ilicon said. "It's not just a question of comedy. Humor is ultimately philosophical and challenging. Reality is funny."

Admittedly, some of $ilicon's humor has nothing to do with the church: He's worried about PC-ness envy, a condition in which a user is overly concerned that someone else's computer has more random-access memory than his.

He's saved

At his pulpit, $ilicon delivers his puns with the conviction of the saved driven by fire and brimstone and in the manner of a pep talk at a sales meeting. "Has your data been saved? Are you ready to log onto the heavenly host mainframe? For I am the wafer, the truth cable, and no math comes to the flow chart but through memory."

Launching into his most infamous Sermon on the Monitor, St. $ilicon begins with the Garden of Eden, or the Griden of Readen.

"The Griden of Readen is where Odd-om learned to love hierarchical structures and upper management. The Griden was surrounded by babbling tributaries with wide bandwidths, and out of its assumptions grew many different kinds of tree structures branching out in all directions. And in this spot, man was to be provided with a great variety and a great abundance of code.

"To create Eve-n, the Giver of Data cast Odd-om into a DP sleep. And so it was that Odd-om got Eve-n."

The serpent, which $ilicon describes as an "excellent salesman and on commission," enters. "D-worm entered the garden through a serial port and wrapped himself around the tree."

Once his audience is through groaning, Armstrong hopes that something more than tortuous puns sinks in. Labeling himself the patron saint of appropriate technology, he addresses the industry's underlying technological assumptions.

"At first, when you go to work in the [computer indus-

Continued on page 91

MARVIN COLLINS

St. $ilicon *and friend prepare sermon*

Tandem lands first OEM contract with AST Research

BY NELL MARGOLIS
CW STAFF

CUPERTINO, Calif. — An approximately $30 million contract with AST Research, Inc. has given transaction processing provider Tandem Computers, Inc. its first OEM agreement in the personal computer arena.

Under the terms of an agreement signed last week, Tandem will distribute the Irvine, Calif.-based desktop computer vendor's entire line, which spans Intel Corp.'a 80286-based models to the high-end 25-MHz AST Premium/386.

AST products will be distributed under the Tandem label. Starting entries, based on AST's 20-MHz 80386-based Premium configurations, are slated for a second-quarter rollout as Tandem PSX 300A workstations, a Tandem spokeswoman said.

For AST, the contract is an affirmation of the company's status as a major OEM supplier, sales Vice-President Bob Becker said in a prepared announcement.

For Tandem, it signals a new departure. The company has been selling workstations manufactured by Wyse Technology.

However, the Tandem spokesman said, "We will be winding down that relationship over a period of time."

It is also the maiden marketing effort of The Tandem Source Co., a recently established corporate division chartered to buy and distribute workstation and terminal products targeted at Tandem customers. Headed by former Tandem sales vice-president Lawrence McGraw, the unit is already negotiating a second OEM contract with an unidentified supplier, the spokeswoman confirmed.

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Wed., Feb. 8, 6:30 a.m.-11:00 a.m.

CW

IN BRIEF

Altai fires back

Data center scheduling software vendor Altai Software, Inc., facing a copyright infringement lawsuit by Computer Associates International, Inc., has fired back with its own suit, accusing CA of "sham litigation" to eliminate competition. In addition to $68 million in damages, Arlington, Texas-based Altai asked that CA be ordered to divest the former Uccel Corp. operations. "The only way we can obtain relief is for [CA] to not have monopoly power in the marketplace," said Gary Leslie, Altai's chief financial officer.

"Altai's position is absurd," said Michael McElroy, CA's assistant vice-president and secretary. He charged that Altai's suit "is based on a theory that it is all right for a small competitor to steal source code from a larger competitor, but when the larger competitor complains, that's a violation of the law."

CA's original suit halted the proposed buyout of Altai by Goal Systems International, Inc.

Spring into multiple megabytes

Fremont, Calif.-based Springer Technologies, Inc. last week received financial backing of an undisclosed amount from an investment group led by controversial computer industry entrepreneur and billionaire H. Ross Perot. Springer is developing "multiple megabyte" computer memory-disk technology. In a licensing agreement with Early Venture Investors, Inc., Springer, through a joint venture company, will manufacture and market a wholly integrated head, fixture assembly and circuit on a chip — reportedly an industry first.

IBM buys Corning subsidiary stake

IBM announced a 25% equity investment in Chatsworth, Calif.-based FOO, Inc., an optoelectronics subsidiary of Corning Glass Works and manufacturer of devices that allow high-volume data transmission on fiber-optic cable. The investment price was not disclosed.

Decision decides on FDR

Decision Data Computer Corp. recently made a major move to boost its third-party maintenance business by acquiring FDR Field Service Co. and a subsidiary from First Data Resources, Inc. FDR services point-of-sale systems and CPUs. Decision Data will fold FDR into its Decision Data Services, Inc. service unit, one of the four largest third-party maintenance providers in the U.S.

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EXECUTIVE CORNER

Apollo gains marketing maven

BY NELL MARGOLIS
CW STAFF

Apollo Computer, Inc. in Chelmsford, Mass., has taken some hefty hits from analysts and the press in the area of its marketing ability.

Last week, the organization put some muscle into its oft-stated intention to toughen its marketing arm, introducing former Texas Instruments, Inc. and Fairchild Semiconductor Corp. executive John Migliore as its new vice-president and general manager of worldwide marketing and strategic planning.

Migliore

Migliore has headed his own consulting firm, Creative Strategies, Inc., since 1987. He will report directly to Apollo Chief Executive Officer Thomas Vanderslice.

In his fourth day on the job, Migliore characterized himself as a man with a relatively easy mission. "A lot of companies wish they had the name recognition and the superior products that Apollo does," he said, noting that increasing the market's perception of such advantages will be largely a matter of "consistency and repetition."

The new marketing leader will get an early and auspicious public debut. On Feb. 1, he will keynote the U.S. introduction of Apollo's eagerly awaited graphics component for its DN10000 superworkstation, while Vanderslice hosts a simultaneous European introduction in Zurich.

David Burdick, who follows the workstation market for San Jose, Calif.-based Dataquest, Inc., saw both the creation of Migliore's job and the selection of Migliore to fill it as positive signs.

"You don't get the luxury of a learning curve in the workstation market," he said. Burdick said that a veteran of the semiconductor industry already knows many of the lessons that need be brought to bear in marketing workstations.

Ashton-Tate Corp. has a newly created position — vice-president of consulting and training services — and the man for the job is the former vice-president of the firm's U.S. and Canada division, Barry Obrand.

He will be succeeded by IBM veteran Wes Richards, who comes to Ashton-Tate after two years as vice-president of sales and marketing at Mountain View, Calif.-based Software Publishing Corp.

Come March, look for **Apple Computer, Inc.** Senior Vice-President of Sales Charles Boesenberg at Sunnyvale, Calif.-based reduced instruction set computing maker **Mips Computer Systems, Inc.**, where he will soon become senior executive.

Taking over Boesenberg's post at Apple is former Apple Vice-President and General Manager of Northwest Operations William Coldrick, who will hand over his old desk to former U.S. Sales Development Director Godfrey Sullivan.

Management Science America, Inc. has a new executive vice-president and chief financial officer.

Former Big Eight certified public accountant and Electromagnetic Science, Inc. executive William F. Evans joined the organization recently.

Techie

CONTINUED FROM PAGE 87

try], you think that decisions are being made to serve the customer. But then you realize that the shareholders are protecting their own assets and interests."

He uses the original Apple personal computer as an example. He said that the company has never been able to develop a good network because, until recently, it has positioned itself as the anarchist company making the computer for the little guy. "Why do you want all those people being networked together and dominated by the MIS director?" he said of the company's early image.

Does this make him unpopular with executives? He says that on the contrary, executives are so taken with the humor in his diatribes that they invite him for return engagements.

St. $ilicon actually does have a following, and he claims his flock is growing. He delivers a weekly Electron Mass on a San Francisco radio station. He says he has a standing invitation to the Vatican, as well as recognition in the European and U.S. press.

Armstrong supports himself through his own company, St. $ilicon, Inc., with speaking engagements and sales of his desktop published *Binary Bible*. He says he is working on a second edition (not a New Testament) with more egregious puns than the original.

Will St. $ilicon let his growing celebrity go to his memory chips? Will his hard disk get too big for his cassock? Will his disciples turn on him and bury him in Basic code, only to rise from storage on David Packard's birthday?

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DEC bungles

CONTINUED FROM PAGE 87

tion is only one: I'd hate to compete with these machines."

Enough said. It's kind of cruel to bring up this failure as DEC basks in the positive response to its latest desktop announcements. The fiasco that was DEC's PC strategy for the past six years has been well documented.

But one couldn't help but notice the parallels on Tuesday. In 1982, DEC unveiled three machines, all running different operating systems and all purporting to be targeted to different audiences. Olsen decided against choosing one PC to represent DEC, claiming that "the market will decide." And as one of his product managers pointed out, "The market decided, and it chose IBM."

This time around, DEC introduced *seven* new machines ranging from a base model personal computer to several high-powered workstations. The machines themselves are impressive, as were the ones in 1982. But once again, marketing questions have leaped up and are begging for answers. Such as, who thought of the names of these varied machines?

The PCs are called Decstations and the workstations are called Vaxstations — except for the main workstation, which is called Decstation. And the machines were given numbers such as 210 and 3520. There were lots of numbers in fact, and not one made any sense. Why, for instance, is there a Decstation 3100 and a Vaxstation 3100? Are they related in any way? Is the customer supposed to be able to differentiate between them?

If, by accident, customers order a Decstation 3100 instead of a Vaxstation 3100, they'll end up with an $11,900 reduced instruction set computing-based Unix machine instead of a $7,950 desktop VMS-based unit.

I asked Jack Smith, DEC's senior vice-president of engineering and manufacturing, about the names, and he gave me a wry smile and said, "We're still thinking about the names." He admitted that there was confusion and said he hoped that people would keep referring to the products by their well-publicized code names, PMAX and PVAX.

I asked Olsen about the names. "They're as confusing to me as they are to you," he replied.

Does this kind of planning represent a marketing strategy? If DEC is starting to get marketing religion, why didn't anybody think of better names for these products? Certainly the names won't make or break them, but confusion about the products helped kill the 1982 PCs. Confusion about product identity has never been a characteristic of success.

These announcements are crucial for DEC, a signal that the company understands which way the trade winds are blowing. It cannot afford to lose the workstation market the way it did the PC market, and these products make it clear that DEC will be a prominent, if not dominant, player. But the new products stand a far better chance of success if DEC learns to play the name and marketing game.

Rifkin is a Computerworld senior editor and co-author with George Hacker of The Ultimate Entrepreneur: The Story of Ken Olsen and Digital Equipment Corporation.

Fourth quarter

CONTINUED FROM PAGE 87

Variations on one or more such themes, Kutnick said, already underlie warnings of fourth-quarter losses by Wyse Technology and AST Research, Inc. and presage a pricing war that could leave widespread damage.

Rumors that the mainframe market is played out have not reached Amdahl Corp. Well-positioned in the midst of a product rollout, the company "just completed its best year yet, and there's no reason to believe that the trend won't continue," said Jeffry Canin, an analyst at Hambrecht & Quist, Inc.

Also standing tall among the giants is IBM, which could achieve double-digit fourth-quarter revenue growth partly fueled by "pretty spectacular" shipments of its Application System/400 mid-range entry, Kutnick said.

In the mid-range market, "the big theme is the bloody, competitive battle for the desk top," Canin said. Although Digital Equipment Corp.'s fourth-quarter results are expected to be less than spectacular, its workstation announcements last week and the imminent enhancement of the already strong VAX 6200 family clearly position the company among the triumphant, Kutnick noted. The promise of a great 1989 should temper any negative reactions to DEC's December quarter, he added.

What can we expect in the workstation niche? "World War III in 1989," according to S. G. Warburg & Co. analyst David Wu. Analysts are looking to billion-dollar market leader Sun for a continuing ascent. Apollo Computer, Inc. should be profitable but not as strong as analysts would like to see it, Dean Witter's McCollum said.

Software and services companies overall enjoyed a good, solid quarter, analysts said. Probable high rollers include Computer Associates International, Inc. and Microsoft Corp., which clearly has the strongest momentum in the microcomputer software sector, according to Rick Sherlund, an analyst at Goldman Sachs & Co.

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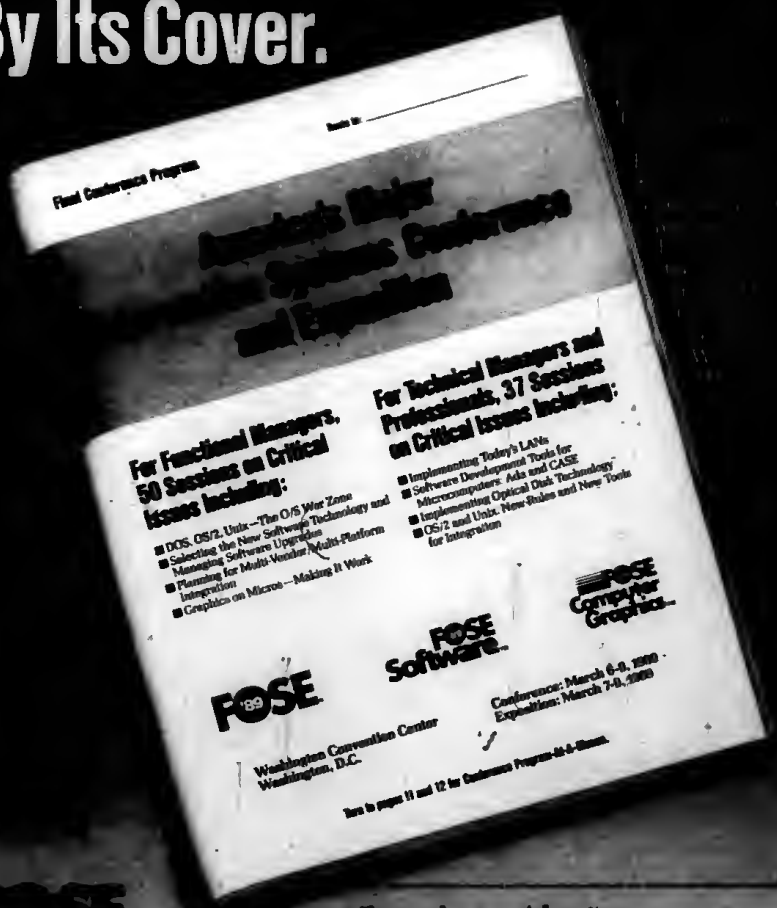

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Ups and downs of job hopping

Employers weigh implications of resumes indicating frequent changes

BY JANET RUHL
SPECIAL TO CW

To programmers, changing jobs every year or two has long been a simple solution to the question of how to raise both salary and skill level, at least during the first five years of a career.

The chronic shortage of experienced technical personnel is part of the picture. Another one is that a manager hiring a new employee can usually offer a more attractive salary than can the employee's current manager, who likely is forced to remain within corporate raise guidelines. Such factors have helped ensure that the technical employee can usually boost his pay 10% to 20% with each job change.

Furthermore, an MIS professional's long-term value to employers rises with his exposure to a variety of software and systems, and changing jobs often equips workers with the skills they need to continue pursuing profitable careers.

The downside

But while job hopping may benefit the professional and his new employer, it can also be an ongoing headache for MIS managers.

Valued employees often leave for better prospects just when they have become most indispensable on their current projects. For this reason, managers sometimes look askance at job candidates with a record of frequent changes.

Don Gloistein, a former department head at Alvin Community Hospital in Alvin, Texas, says a pattern of jobs lasting three to six months is probably the most disturbing, suggesting that the employee has failed to get through the probationary period.

According to Mark Jacobs, a senior consultant at Data Pros, an East Hartford, Conn., recruiting firm, most employers prefer to see an employee who has put in three years or more at a company.

But, Jacobs says, the major factor determining a manager's attitude toward frequent job changers is the career pattern prevalent among current employees.

At a company at which most managers are long-term employees — many coming to the firm straight out of college — job hoppers have a much slimmer chance of being considered than they do at companies employing managers who built their careers by making well-timed changes.

Edward Wisnewski, vice-president of staffing at Bank of America Systems Engineering in San Francisco, says that in his organization, he finds wide differences in how job hopping is defined, with the determining factor more often than not being the career pattern of the individual doing the hiring. Managers who have made their career with one or two companies tend to look less favorably at frequent job changers than do managers with more varied histories.

But longevity in a previous job does not guarantee that an employee will be satisfactory. "I got burned by solid resumes too," reports Gloistein, who says some hires had stayed on in previous positions only because they "weren't bad enough to get fired."

Jim Wetzel, a general supervisor in the information systems department of Baltimore Gas & Electric Co., claims that for him, the key to screening out candidates with this kind of "stability" is to make certain there has been a steady progression in responsibility at the applicant's previous job.

Role playing

Another factor that weighs heavily in hiring is the employee's role. Jacobs and Wisnewski agree that if a company is trying to find a technical specialist with experience using a hot new technology such as IBM's DB2 or automated teller machine networking, it may be more inclined to make allowances for a busy resume if the employee can demonstrate solid experience using the new technology.

> WHILE JOB hopping may benefit the professional and his new employer, it can also be an ongoing headache for MIS managers.

Another situation that can influence the decision is the hiring manager's familiarity with the applicant's previous employers. If the companies are known to have serious, ongoing turnover problems, poor pay or a reputation for promising would-be employees more than they can deliver, managers tend to look with less suspicion on employees who have left jobs after a short time.

A manager's decision to hire an attractive, obviously capable prospect who has a history of frequent job changes also has a lot to do with the manager's feelings about how well his own company treats its employees. The manager who knows his company will not let him lose a good employee over a few dollars an hour is more likely to approve a hire in a borderline case.

Hopping helps consultants

Interestingly, the job hopping that works against the technical person applying for a regular job may work for him if he is being considered as a consultant. When evaluating consultants, who are usually only expected to work for a short time on a project, clients are interested almost exclusively in the applicant's skills — something frequent job changes can expand.

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Tom Rawson, an independent consultant and software developer at J. P. Software in Arlington, Mass., points out that for consultants, a history of short-term assignments can be a good record, because it shows that "they did what they contracted with the client to do."

Furthermore, once a programmer has done good work as a consultant and shown that he fits into the department, the client might hire him as an employee should the opportunity arise, even if his resume had "too many" jobs.

Ruhl is a consultant programmer in Windsor, Conn.

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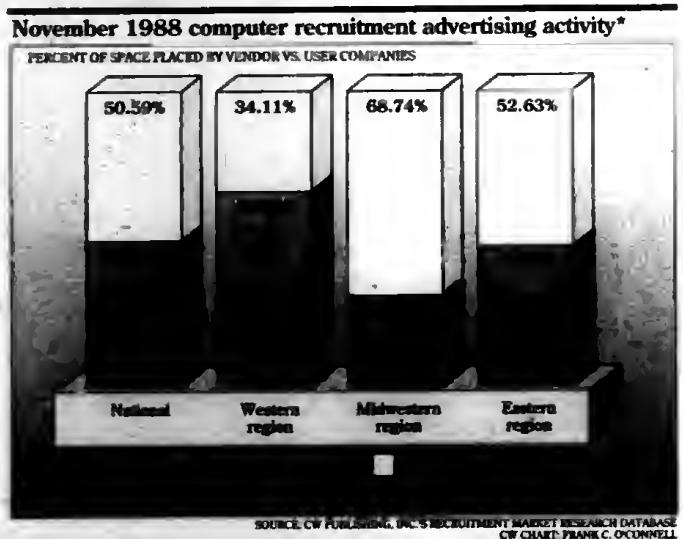

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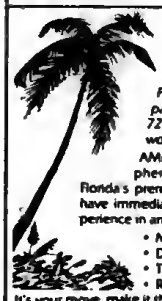

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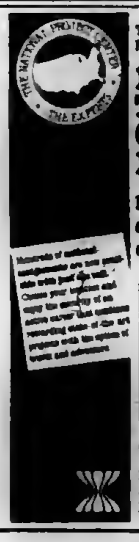

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Telex used values remain stable

Supply of 079 and 179 color terminals is short as popularity holds

BY LUCINDA SANTISARIO
IDC FINANCIAL SERVICES CORP.

A little over a year ago, Memorex International N.V. and Telex Corp. agreed to merge, forming the world's largest plug-compatible manufacturer.

On June 3, the combined Memorex Telex N.V. announced the 1191, 1192, 1091, 1092 display station families. These terminals have been positioned against IBM's 3191 and 3192 terminal offerings, replacing older 3191- and 3192-compatible Memorex and Telex displays.

The most recent Telex terminal to appear on the used marketplace is the Telex 191. This 12-in. entry-level monochrome display, which was first introduced by Telex in January 1987, has been withdrawn from the market and has since been replaced by the Memorex Telex 1191 family. The Telex terminal is currently trading for 62% ($900) retail.

The Telex 078 Model 1, which was replaced by the Telex 191, is currently trading for 26% ($400) retail on the used market. The 078 Model 1 was first introduced in August 1984 and was positioned to compete with IBM's 3178 monochrome terminal family. End users have been migrating from this older terminal to the Telex 191 on the used market or to the newer 1191 from Memorex Telex.

The 079 and 179 Telex color terminals remain in short supply on the used market. In June 1988, Memorex Telex replaced the Telex 079 and 179 with the 1092 C and 1192 C, respectively. End users have been moving gradually from the popular 079 and 179 to the new replacement boxes. Thus, used values have continued to hold for these color terminals.

The 079 Model 1 is an entry-level 12-in. color terminal that is currently trading for 42% ($800) retail. The 179 Models 2, 3 and 4 are enhanced 14-in. displays, which were announced to compete against IBM's 3179 Model 1. The 179 Models 2, 3 and 4 are currently trading for 47% ($900) retail.

In comparison with IBM, few used Telex terminals trade on the secondary market. It is for this reason that a stable end-user take-out market does not exist. Very few dealers are willing to take Telex terminals into their inventory, causing the end-user take-out market to be a "whatever you can get for it" situation. Dealers are painfully aware that they may have to sit on one of these terminals for a while before finding a buyer. Therefore, they are offering end users low take-out values as a hedge against future used market declines.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc at 508-872-8200.

Telex terminals

Current fair market values

Model	List	Retail	Closest IBM Equivalent
191	$1,295	62%	3191
078-1	$1,535	26%	3178
079-1	$1,895	42%	Color 3178
179-2,3,4	$1,895	47%	3179

SOURCE: IDC FINANCIAL SERVICES CORP.
CW CHART

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The BoCoEx index on used computers

Closing prices report for the week ending Jan. 6, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	$675	$900	$400
XT Model 086	$1,150	$1,250	$900
XT Model 089	$1,225	$1,575	$1,050
AT Model 099	$1,675	$2,400	$1,525
AT Model 239	$1,925	$2,900	$1,800
AT Model 339	$2,050	$3,600	$1,800
PS/2 Model 30	$1,650	$1,700	$1,300
PS/2 Model 50	$2,325	$2,600	$1,900
Compaq Portable I	$600	$975	$600
Portable II	$1,700	$2,000	$1,650
Portable III	$2,900	$3,175	$2,500
Portable 286	$1,750	$1,975	$1,675
Plus	$1,100	$1,250	$800
Deskpro 286	$2,200	$3,150	$1,800
Deskpro 386	$3,600	$3,975	$3,800
Apple Macintosh 512	$625	$950	$550
512E	$850	$1,025	$600
Plus	$1,150	$1,325	$950
II	$4,200	$5,100	$3,800
Apple Imagewriter II	$375	$400	$325
Toshiba T3100	$2,500	$2,500	$2,000

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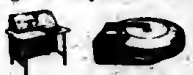

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2. Adequacy and completeness of the technical proposal and response to support questions.
3. Compliance with terms, conditions, and other provisions of the RFP.
4. Qualifications and experience of the vendor's assigned personnel.
5. Prior experience of the vendor in installing systems similar in scope and complexity.
6. Total cost of the proposed contract.

Proposals must comply with the Authority's Contract Documents. The Authority, at its option, may enter into negotiations with one or more proposers it selects as provided for in the Information for Proposers section of the Contract Documents. Copies of such documents may be secured from Ms. Angie Prifer, Secretary, Department of Procurement Services, Metropolitan Transportation Authority, 347 Madison Avenue, New York, N.Y. 10017.

INQUIRY	DATE	TIME
[illegible]	[illegible]	3PM

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Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

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Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive technalities.

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FOR: "IBM 3089-002, 3089-003, 3090-220, 3192-GDO, 3151-310, 7427-001, 3092-003, 4244-2C2, 3090-003, 3090-002, 3090-BJ4, 3090-BK4, 3746-310, 3746-L13, 3174-01L and 3914-001.

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Unraveling SQL for MIS pros

Trainers should be versed in the language's many far-reaching effects

BY JONATHAN SAYLES
SPECIAL TO CW

Sequential query language — known as SQL — is a database access language that is emerging as the industry standard for relational database management systems. It presents a unique challenge to data processing trainers for several reasons.

First, relational DBMSs are new to the production world in most organizations. Requests for training in IBM's DB2 and other systems are just arriving.

Second, there is an implied contradiction in marketing hype surrounding these products, such as the claim "simple, yet powerful." These contentions raise questions such as, How simple? Simple for whom? Simple without training or because of it?

Third, SQL is new. Its role in production applications is not well defined in many shops. Is SQL a programmers' language? An end users' language? If it is the latter, how far do we take end-user training?

Finally, SQL exists in many dialects among different vendors' DBMSs. If you use Relational Technology, Inc.'s Ingres on personal computers, Oracle Corp.'s Oracle on Digital Equipment Corp.'s VAX machines and DB2 on the mainframe, which SQL do you teach?

Fortunately, unless DP trainers are directly involved in SQL training, there is no need for them to become experts in the technology. They will, however, need to be conversant in the following four areas:

- **Relational terms and concepts.** The near and long-term future of DP belongs to relational and distributed relational systems and products. You must be able to identify and describe the basic components and critical issues of these new technologies.
- **SQL.** The common data access language for relational and distributed relational systems will be SQL. You should understand SQL at least to the extent that you currently know Cobol.

You should participate in an SQL class or computer-based training course to gain a first-hand understanding of the technology's strengths, which include set-level processing, English-like syntax, a short initial learning period, data independence and simple data structures. Don't make any long-range SQL training decisions until you have met SQL in person.

- **Relational database and application design.** The system development life cycle is being changed in fundamental ways by extended relational analysis, prototyping tools and techniques and modern database and application design methodologies.

These changes will alter your company's training needs dramatically. However, DP trainers, except for ones teaching database or application design, need understand only what these methodologies are (at a high level); how the organization is going to employ them; and who needs to master them, as well as the training alternatives, which are usually limited.

- **Decision support products, computer-aided software engineering tools and fourth-generation language application generators.** The technologies in this category, aimed at improving productivity, vary greatly. Again, trainers in general need only understand what they are, how their organization is going to employ them and what training alternatives are available.

> WITHOUT THE support of trainers, many of the financial gains made possible by productivity-enhancing tools and services can be lost.

Everybody thinks so

If all this learning seems like a lot of work, take heart — your sentiments are echoed throughout the organization. Moving to new technologies is work for all affected areas of a company. The phrase "gearing up" for DB2, Oracle or Ingres means taking the time to get retrained in new procedures, concepts and approaches — not fearing radical new means of going about your day-to-day business.

DP trainers must be on the leading edge of implementing these new technologies. Without the support of trainers, many of the financial gains made possible by productivity-enhancing tools and services can be lost.

Poor training, misdirected training or — worst of all — lack of training in these technologies will lead to ineffective use by applications personnel. The decision to go to a relational database does not simply involve purchasing software and a few more direct-access storage devices; it means a restructuring of job specifications as well as systems design and development methodologies, not to mention a hefty amount of training.

These repercussions are the reason DP trainers must become conversant in the relevant areas. Without their advice and help, corporate efforts to implement new technologies such as SQL can end up costing more than necessary and perhaps even failing.

Training is not a peripheral or secondary support activity; it is an intrinsic part of the successful deployment of SQL or any new strategic corporate technology.

Sayles is director of educational services at The Systems Group, Inc. in Glastonbury, Conn.

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Feb. 13	Special Feature: Recruitment	Performance Management Tools
Feb. 20	Strategic Planning	
Mar. 6	Special Feature: Systems Integration Executive Report: MIS in the Federal Government	

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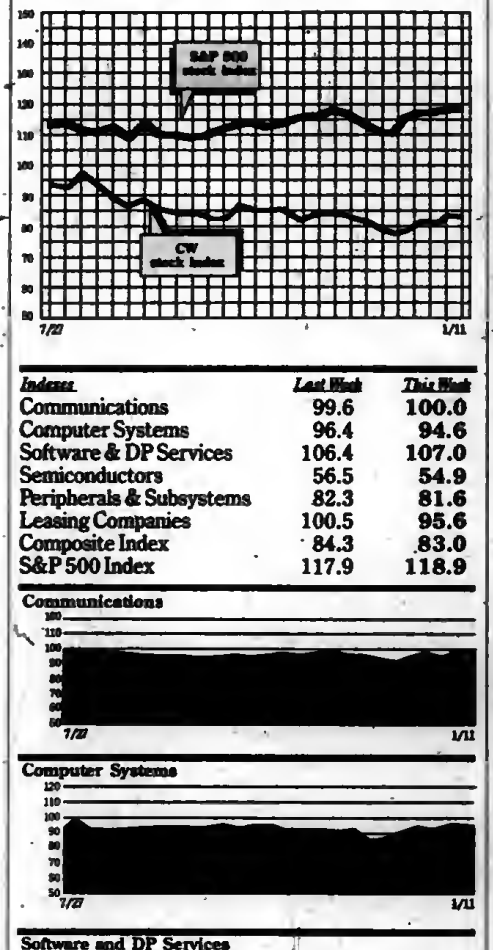

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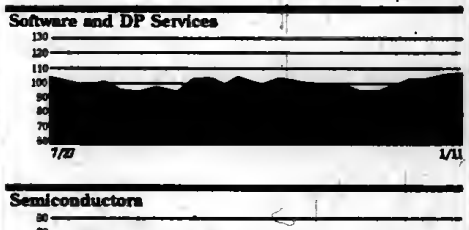
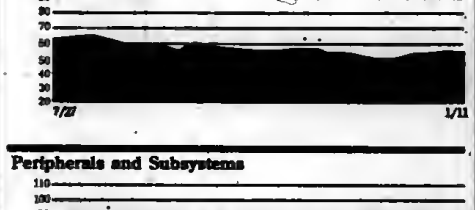
Software & DP Services	106.4	107.0
Semiconductors	56.5	54.9
Peripherals & Subsystems	82.3	81.6
Leasing Companies	100.5	95.6
Composite Index	84.3	83.0
S&P 500 Index	117.9	118.9

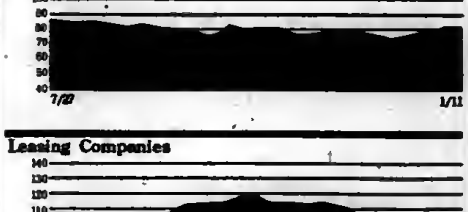
Communications



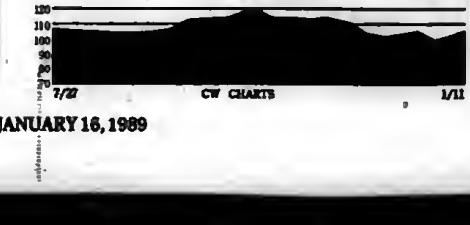
Computer Systems



Software and DP Services



Semiconductors



Peripherals and Subsystems

Leasing Companies

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JAN. 11, 1989

E		52-WEEK RANGE (1)	CLOSE JAN. 11 1989	WEEK NET CHANGE	WEEK PCT CHANGE
		PRICE			
Communications and Network Services					
O	AMERICAN INFO TECHS CORP	88	85	28.25	0.1	0.1
O	ANDREW CORP	32	19	19.5	0.0	0.0
O	ARTEL COMM CORP	3	1	1.563	0.0	0.0
N	AT&T	30	24	28.875	0.1	0.4
O	AVANT GARDE COMP INC	6	3	0.594	-0.1	-13.7
N	AVNET INC	8	4	5.875	0.4	6.8
N	AYDIN CORP	17	12	15.375	-0.1	-0.6
N	BELL ATLANTIC CORP	75	64	70.625	0.0	0.4
N	BELLSOUTH CORP	44	36	39.625	0.3	0.4
O	COMPUTER LABS INC	6	6	3.375	-0.5	-6.5
O	COMPUTER NETWORK TECH	6	1	1.969	0.0	13.8
O	CONTEL CORP	43	35	41.875	1.8	4.4
O	DATA SWITCH CORP	10	6	8.875	-0.1	-3.1
O	DIGITAL COMM ASSOC	28	17	22.875	4.1	22.0
O	DYNATECH CORP	34	17	16.5	-0.5	-1.3
O	FIBERMUX INTERNATIONAL INC	3	2	4.125	0.1	3.1
O	GANDALF TECHNOLOGIES	6	6	5.5	-0.5	-8.5
O	GENERAL DATACOMM INDS	6	3	8.25	0.8	16.7
N	GTE CORP	48	34	40.25	-0.5	-0.6
O	INFOTRON SYS CORP	14	6	10.5	-0.1	-1.2
N	ITT CORP	59	43	52	0.8	1.5
N	M/A COM INC	11	5	8.875	0.0	0.0
O	MCI COMMUNICATIONS CORP	28	10	22.875	-0.1	-0.5
O	NETWORK EQUIPMENT TECH INC	35	14	17.25	-0.5	-0.6
O	NETWORK SYS CORP	12	7	10	-1.0	-9.1
N	NORTHERN TELECOM LTD	28	19	16.25	-0.1	-0.6
O	NOVELL INC	23	19	20.25	-2.8	-6.5
N	NYNEX CORP	71	61	65.375	-0.6	-0.5
N	PACIFIC TELESIS GROUP	39	28	31.25	0.5	1.6
O	PARADYNE CORP	10	4	10	0.0	0.0
A	PENRIL CORP	6	3	4.375	0.0	0.0
N	PLESSEY PLC	41	35	38.75	-1.5	-3.5
N	SOUTHWESTERN BELL CORP	49	38	41	1.5	3.8
N	SPRINT	29	18	23.625	-0.5	-2.5
N	U S WEST INC	39	48	57.625	0.5	0.0
Computer Systems						
O	ALLIANT COMPUTER SYS	6	3	3.813	-0.5	-7.5
O	ALPHA MICROSYSTEMS	6	4	5.25	-0.5	-8.5
O	ALTOS COMPUTER SYS	10	7	8	0.1	1.5
A	AMDAHL CORP	28	14	20.625	1.1	5.9
O	APOLLO COMPUTER INC	17	7	8.125	-0.5	-5.5
N	APPLE COMPUTER INC	49	28	42.125	0.1	0.0
O	BOLT BERANEK & NEWMAN	18	10	10.5	0.2	2.4
O	BRITTON LEE INC	6	1	2.875	0.4	15.0
N	COMPAQ COMPUTER CORP	65	42	61.875	-0.5	-0.8
O	COMPUTER AUTOMATION INC	14	6	6.25	-0.6	-10.0
A	COMPUTER CONSOLES INC	12	8	12.625	0.0	0.0
O	CONCURRENT COMP CORP	7	4	6	0.6	11.1
N	CONTROL DATA CORP	31	16	21.875	1.3	6.1
O	CONVERGENT TECH	7	3	6.375	0.0	0.0
O	CONVEX COMPUTER CORP	11	6	6.75	-0.5	-4.6
O	CRAY RESH INC	89	63	66.5	-2.0	-3.3
O	DAISY SYS CORP	12	6	6	-0.8	-12.7
N	DATA GEN CORP	28	17	18.375	-0.5	-0.6
N	DATAPOINT CORP	6	4	4.375	-0.1	-0.6
O	DELL COMPUTER CORP	16	6	9.25	-1.1	-10.8
N	DIGITAL EQUIP CORP	132	86	98.625	-0.6	-0.6
O	FLOATING POINT SYS INC	6	2	3.25	-0.8	-10.0
O	HARRIS CORP	33	24	28.25	0.6	2.3
N	HEWLETT PACKARD CO	59	44	52.625	-1.3	-0.6
N	HONEYWELL INC	77	58	61.375	1.0	1.7
N	IBM	120	104	122.25	-0.5	-0.5
O	INFORMATION SYS, INC	16	10	14.5	-0.3	-1.7
O	IPL SYS INC	6	1	6	0.0	0.0
O	MAI BASIC FOUR INC	21	6	8.25	-0.5	-6.5
O	MATSUSHITA ELEC IND(ADR)	230	188	207	1.4	0.7
O	MEGADATA CORP	4	1	1.75	0.1	7.7
O	MENTOR GRAPHICS CORP	37	19	26.25	-0.5	-0.1
O	NBI INC	7	0	1.75	-0.6	-20.0
N	NCR CORP	70	51	55.875	0.8	1.4
N	PRIME COMPUTER INC	20	12	16.875	0.5	3.7
O	PYRAMID TECHNOLOGY	17	6	10	-0.5	-5.0
O	SILICON GRAPHICS CORP	25	14	17.0	-2.0	-10.3
O	STRATUS COMPUTER	32	20	27.5	-0.8	-2.7
O	SUN MICROSYSTEM INC	20	13	16.75	-0.5	-2.8
O	SYMBOLICS INC	2	1	1	0.0	0.0
O	SEQUENT COMPUTER SYS INC	26	12	19	0.3	1.6
N	TANDEM COMPUTERS INC	22	16	17	-0.5	-0.6
N	TANDY CORP	49	32	40.25	-0.6	-1.5
N	ULTIMATE CORP	18	6	9.25	-0.4	-3.9
N	UNISYS CORP	28	20	26.375	-0.6	-0.6
A	WANG LABS INC	17	8	8.75	0.1	1.4
Software & DP Services						
O	ADVANCED COMP TECH	6	1	1.75	0.0	-1.5
O	AMERICAN MGMT SYS INC	19	12	16.875	-0.5	-0.6
O	AMERICAN SOFTWARE INC	17	6	17	0.0	0.0
N	ANACOMP INC	12	6	8.875	-0.1	-1.5
O	ANALYSTS INTL CORP	14	7	12.875	0.4	3.0
O	ASHTON TATE	31	20	22	0.0	0.0
O	ASK COMPUTER SYS INC	10	7	10.75	-0.6	-2.3
O	AUTODESK INC	31	18	28.5	-0.6	-0.6
O	AUTO DATA PROCESSING	47	28	38.25	-0.1	-0.3
O	BMC SOFTWARE INC	14	8	14	0.6	4.7
O	BOOLE & BABBAGE INC	12	7	11.25	1.5	16.4
N	BUSINESSLAND INC	16	6	14.375	-0.1	-0.6
O	COMPUTER ASSOC INTL INC	34	24	32.5	0.1	0.4
O	COMPUTER HORIZONS CORP	12	7	10.125	0.5	5.2
N	COMPUTER SCIENCES CORP	53	38	47	-0.5	-1.1
O	CORPORATE SOFTWARE	16	6	10	0.0	0.0
N	COMPUTER TASK GROUP INC	17	10	10	-0.5	-4.7
O	CSP INC	6	6	6.625	0.0	0.0
O	CUSHING INC	28	16	22.5	1.5	7.1
N	DELLNET SOFTWARE INC	8	4	6.375	-0.4	-6.5
O	DUN & BRADSTREET SYS INC	34	20	21.75	-0.6	-0.6
N	EDS/PLANNING (CLS E)	48	34	42.5	-1.0	-2.3
O	HOGAN SYS INC	6	6	4.625	0.0	0.0
O	INFORMIX CORP	35	7	8.125	-0.1	-1.5
O	INTELLICORP INC	4	3	2.875	0.1	0.0
O	INTERIC INC	16	7	14.25	0.0	0.0
O	LOTUS DEV CORP	34	10	19.375	0.4	2.0
O	MANAGEMENT SCI AMER	14	6	8.75	0.4	4.5
O	MICRO PRO INTL CORP	4	3	3.188	-0.1	-0.4
O	MICROSOFT CORP	71	46	52.5	-1.5	-3.2
O	MORINO ASSOCIATES INC	20	12	16	0.1	0.7
O	NATIONAL DATA CORP	22	16	20	0.3	1.5
O	ON LINE SOFTWARE INTL INC	14	4	4.75	-0.5	-9.5
O	ORACLE SYS CORP	22	11	20.25	0.3	1.3
N	PANSOPHIC SYS INC	16	12	14.375	0.6	1.8
O	PHOENIX TECHNOLOGIES INC	16	12	15.25	-0.3	-1.6
O	POLICY MGMT SYS CORP	28	19	24	0.6	1.1
O	PROGRAMMING & SYS INC	16	6	16.75	-0.5	-2.8
O	RASBY SOFTWARE INC	3	3	3	0.0	0.0
O	RELATIONAL TECHNOLOGY INC	21	12	16.125	-0.4	-2.4
O	REYNOLDS & REYNOLDS CO	35	17	26.125	1.5	6.0
O	SBI CORP	22	14	16.6	-0.6	-4.3
O	SHARED MED SYS CORP	27	14	17.5	0.3	1.4
O	SAGE SOFTWARE INC	6	5	7.75	0.0	0.0
O	SOFTWARE PUBS CORP	27	8	10	0.3	1.5
A	STERLING SOFTWARE INC	6	6	8.875	0.1	2.2
O	SUNGARD DATA SYS INC	22	14	17.125	0.0	0.0
O	SYSTEMATICS INC	34	24	31	-0.1	-0.4
N	SYS. SOFT INC	28	12	28	1.5	4.7
O	VM SOFTWARE INC	18	7	17.375	-0.5	-1.4
Semiconductors						
O	ADV MICRO DEVICES INC	17	7	8.625	-0.4	-4.3
O	ANALOG DEVICES INC	18	10	12.75	0.0	0.0
O	ANALOGIC CORP	6	6	3	0.3	3.9
O	CHIPS & TECHNOLOGIES INC	21	11	18	-0.1	-0.6
O	CYRIX CORP	37	18	34	-0.5	-1.5
O	LSI LOGIC CORP	14	7	10.25	-0.6	-5.7
O	MICRON TECHNOLOGY INC	28	13	16.125	-0.3	-1.5
N	MOTOROLA INC	38	28	42	-0.1	-0.3
N	NATL SEMICONDUCTOR	30	8	9.25	-0.8	-7.5
O	TEXAS INSTRS INC	67	38	44.375	-0.6	-1.5
A	WESTERN DIGITAL CORP	18	11	13.5	-1.6	-10.7
Peripherals						
O	ALLOY CORP	3	3	3.5	-0.5	-0.1
N	AM INTL INC	6	6	6	-0.1	-2.4
O	AST RESH INC	17	7	8	-0.5	-6.0
O	AUTO TROL TECH CORP	6	3	4.875	-0.1	-0.5
O	BANCTEC INC	12	6	10.125	-0.5	-4.7
O	CIPHER DATA PRODS INC	10	6	10	0.4	3.9
A	COMPUTROLER CORP	4	2	2.5	0.1	5.3
O	CONNER PERIPHERALS	10	7	8.75	0.0	0.0
A	DATAPRODUCTS CORP	10	8	14.25	0.1	0.8
O	DATARAM CORP	8	6	7.375	0.0	0.0
O	EASTMAN KODAK CO	33	28	44.875	-0.4	-0.8
O	E M C CORP MASS	19	4	6	-0.4	-7.5
O	EMULEX CORP	12	3	11.75	0.0	0.0
O	EWANS & SUTHERLAND	33	13	16.875	-0.4	-2.3
O	IDOT CORP	6	2	0.0	0.0	0.0
O	INTERLEAF INC	21	6	8.375	0.5	6.7
O	IOMEGA CORP	3	2	0.75	0.0	0.0
O	LSI DATA CORP	4	0	0	0.0	0.0
O	MAGNETOR SYS CORP	4	2	3.188	-0.1	-3.8
O	MAXTOR CORP	10	6	6.0	-0.3	-4.8
O	MICROPOLIS CORP	20	6	7.625	-0.5	-6.0
O	MICROTIME CORP	14	3	7.625	-0.8	-10.9
N	MINNESOTA MNG & MFG CO	67	38	61.125	-1.1	-1.9
O	PERSONAL COMPUTER PRODUCTS INC	7	3	4.875	0.0	0.0
O	PRIAM CORP	6	1	1.188	-0.1	-6.5
O	PRINTRONIX INC	11	7	8.125	-0.5	-5.8
N	QMS INC	10	6	8.125	0.1	1.5
O	QUANTUM CORP	15	10	14.625	0.6	4.5
N	RECOGNITION EQUIP INC	12	6	12	0.1	1.1
O	REXON INC	6	4	6.75	-0.5	-6.8
O	SEAGATE TECHNOLOGY	33	7	10	-0.3	-2.4
O	STORAGE TECH CORP	4	1	1.75	-0.1	-6.7
O	TANDON CORP	6	1	1.625	-0.1	-5.8
A	TEC INC	3	2	0.125	0.1	8.7
N	TEKTRONIX INC	30	19	21.5	0.0	0.0
O	TELEVIDEO SYS INC	6	3	0.5	0.1	14.3
N	XEROX CORP	50	30	55.875	1.1	1.8
Leasing Companies						
O	AMPLIDON INC	10	9	10.75	0.0	2.7
N	CAPITAL ASSOCIATES INTERNATIONAL INC	7	4	6.25	-0.1	-0.8
O	CORROON INC	28	17	22	0.6	2.8
O	CONTINENTAL INFO SYS	6	1	1.375	-0.5	-31.8
O	LDI CORPORATION	14	10	13.25	0.6	3.9
O	PHOENIX AMERN INC	4	0	0	-0.3	-5.9
O	SELECTERM INC	6	4	6	0.1	2.5

EXCHANGE—NEW YORK(N)—AMERICAN(A)—NATIONAL

Stockade

CIS finds itself in a jam when it fails to meet payment

Upstate New York is known for its tough winters, but Syracuse, N.Y.-based computer leasing firm Continental Information Systems Corp. (CIS) was battered by much more than the cold and snow last week.

CIS stock, already trading at depressed levels from earlier company woes, lost more than 50% of its value in four days, plunging from 2⅛ points to Thursday's close of 1 point, a new low for the year. Precipitating the drop was the company's revelation that it was late on an interest payment to a creditor and is seeking the sale of all or part of the company (see story page 12). CIS traded as high as 9⅛ during the past year.

Wall Street takeover rumors boosted the stock of financially stumbling Digital Communications Associates, Inc. DCA added 2⅛ points during the week to close Thursday at 22⅛.

The market reacted coolly to Digital Equipment Corp.'s splashy workstation announcements. DEC lost ⅛ of a point on announcement day but ended Thursday with a net gain of ⅝ of a point to close at 100⅛. IBM, in a strong week for the Dow Jones industrial average, rose 1⅝ points to 123⅛.

CLINTON WILDER

DEC products received with cautious optimism

BY JAMES DALY
CW STAFF

MAYNARD, Mass. — If it were the Super Bowl, the announcer might say that in last week's desktop product blitz, Digital Equipment Corp. President and quarterback Ken Olsen uncorked a long game-winning pass into an end zone filled with waiting receivers.

Trouble is, many of DEC's customers are still deciding whether they will — or even want to — catch the toss.

Users contacted last week by *Computerworld* expressed a mixture of reserved optimism and lingering doubt as they crossed their arms and fingers and waited to see whether DEC could really do what it has boldly promised — deliver a quick and total desktop package.

More than a dozen hardware and software announcements constituted the largest introduction in DEC's 31-year history, including machines ranging from personal computers to a workstation capable of processing 14 million instructions per second.

Die-hard DEC devotees said they thought the broad rollout was just what they have been waiting for. "I like DEC, and I've been taking a lot of lip because Sun and Apollo are doing a better job in the workstation market," said an impressed Steve St. Ong, systems manager at Square D Co., an electrical equipment maker in Milwaukee.

St. Ong said that his firm is interested in connecting the new DEC Vaxstation 3100 to its VAX-11/780 because "we've got developers who like that machine a lot, and it's going to be tough to sell them on anything but VAX and VMS."

Other DEC supporters chose to keep their cards a little closer to the vest, especially those with lingering memories of DEC's earlier ill-fated desktop products. "We've been looking forward to it, but we've got to be cautious," said Peter Link, manager of engineering systems at Marathon Electric Manufacturing Corp. in Wausau, Wis., who was evaluating the high-end Decstation 3100. "[DEC's past desktop failures] will make us think twice about buying. We're not going to jump in and say 'They're here at last' without doing some careful thinking."

DEC's past desktop failures have also made even the most devoted fans edgy. "I'm a big DEC fan — I've always had DEC equipment and probably always will — but I would trust them more with medium- and large-size mainframes than what they would come out with for the desktop," said Jack Chambers, director of communications and information technology at Duquesne University in Pittsburgh. "Even some of their own salesmen wouldn't recommend the Vaxmate to us."

It is these devotees that DEC's marketing department needs to pursue most vigorously if it is going to attain the company's goal of becoming the No. 1 workstation vendor in the world. "Our goal is to win the desk top," Vice-President of Low-End Systems Dom Lacava said.

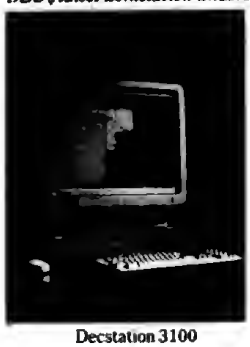
And they may have already made leaps in that direction, claiming at least 5,000 first-day orders for the new products.

DEC may achieve at least part of its goal by simply maintaining accounts that have been hemorrhaging over to vendors such as Sun Microsystems, Inc., Apollo Computer, Inc. and Hewlett-Packard Co. "DEC's customers could put up with its lousy [workstation] performance for only so long; then they looked elsewhere," said Steve Blank, head of marketing at Ardent Computer Corp. and cofounder of Mips Computer Systems, Inc., which makes the R2000 reduced instruction set computing microprocessor used in the new Decstation 3100. "I think this could stop that sort of attrition."

Still, DEC may face an uphill battle among even its loyal users. "We're not overwhelmed, because there is nothing magic in the announcement," said Clark Lambert, director of data processing at the *Kansas City Star* in Kansas City, Mo., where a Vaxcluster supports more than 100 personal computers.

Going for it all

DEC's latest workstation undercuts the price/performance champions of its major competitors



Decstation 3100

Model	CPU	Performance (in MIPS)	Base price
DEC Decstation 3100	RISC-based[1] proprietary	14	$11,900
Sun-4/110	Sparc[2] proprietary	7	$18,900
Apollo 4500 Personal Super Workstation	Motorola 68030	7	$18,990
IBM RT 6150 Model 135	RISC-based proprietary	5.6	$30,595
HP 9000 Model 360	Motorola 68030	4.5	$14,400[3]

[1] Reduced instruction set computing
[2] Scalable Processor Architecture
[3] Reflects 10% price cut last week

CW CHART: FRANK C. O'CONNELL

Full lineup

In addition to a RISC workstation, DEC introduced three PCs and VAX architecture workstations

	Operating system	Memory	Hard disk capacity	CPU	Base price
Decstation PCs					
• 210	MS-DOS	640K	NA*	10-MHz Intel 80286	$2,630
• 316	MS-DOS	1M	NA	16-MHz Intel 80386	$3,485
• 320	MS-DOS	2M	NA	20-MHz Intel 80386	$4,960
Vaxstations					
• 3520	VMS, Ultrix	8M-64M	5	2 CMOS VAX	NA*
• 3540	VMS	8M-64M	10	4 CMOS VAX	NA
• 3100	VMS, Ultrix	8M-32M	3	1 CMOS VAX	$7,950 diskless

* Not available

SOURCE: DIGITAL EQUIPMENT CORP.
CW CHART: FRANK C. O'CONNELL

Solbourne Sun-4-compatible bows

BY NELL MARGOLIS
CW STAFF

LONGMONT, Colo. — Japanese-backed startup Solbourne Computer, Inc. will announce today a multiprocessing superworkstation that claims full software compatibility with Sun Microsystems, Inc.'s Sun-4 workstation series.

Solbourne uses Sun's Scalable Processor Architecture (Sparc). The company's goal is to establish the Sparc-based Sun-4 as the de facto standard workstation platform while offering current and prospective Sun users an alternative source, said founder and Chief Executive Officer Douglas McGregor.

Analysts and early users last week said that the fledgling company could do just that. "We're pretty bullish on Solbourne for several reasons," said David Burdick, an analyst at San Jose, Calif.-based market research firm Dataquest, Inc.

Technology touted

One reason, he said, is the technology itself. The machines include the eight-model, one- to four-processor Sun-4/600, which offers between 9.5 and 30 million instructions per second (MIPS) and is capable of 1.6 million to 4.7 million floating-point operations per second.

By way of comparison, a two-processor Sun-4/602 equipped with 16M bytes of memory, a 327M-byte disk and a 150M-byte cartridge tape yields up to 17 MIPS for $51,400 — bettering the performance of a similarly configured Sun-4/260 by 70% at a 14% price break, according to a Solbourne spokeswoman.

"We're very happy with Sun, but we'd like to stretch our limited resources as far as possible," said Mitchell Levin, director of the Computer Science Laboratory at Rensselaer Polytechnic Institute in Troy, N.Y. A "fairly heavy Sun user" and Solbourne beta-test site, RPI jumped at the chance to try an alternative with a price/performance advantage.

The Solbourne workstation, used since October on a computer stereo vision application, "has essentially done everything Solbourne promised," Levin said.

Japanese electronics giant Matsushita Electric Industrial Co., which owns 52% of the company and is manufacturing the Sun-4, funded Solbourne's research and development effort to the tune of $11.75 million and is providing a $38.9 million round of startup funding.

More from DEC blitz

DEC also disclosed the following last week:

- VAX PC, a Microsoft Corp. MS-DOS emulator for VAXs, particularly the Vaxstation 3100, will be available in March 1989 at a single-user charge of $500. A future release of VAX PC will include DEC's VAX/VMS services for MS-DOS. That will allow Vaxstation and PC users to share MS-DOS-based data, applications, disks and printers, said Richard Treadway, Decwindows program manager. An Ultrix version is scheduled to come later.
- Several components in its Vaximage program, including the Vaximage Scanning Subsystem, a $5,500 scanner for VMS workstations. DEC also announced Vaximage Scanning Application, a $600 package for creating image files. Vaximage Application Services is a set of software tools for developing image applications. It is priced at $1,900 for a single-user license. The products are scheduled to be available in February.
- Applications written for Ultrix cannot run on the reduced instruction set computing Decstation 3100 without some porting. Out of roughly 1,000 Ultrix applications, 20 have been ported to the Decstation 3100.
- Ultrix will eventually be offered in a version that includes symmetrical multiprocessing. Until then, the Vaxstation 3520 and Vaxstation 3540 will be able to run Ultrix only in asymmetrical multiprocessing mode.

DEC pins hopes on connectivity

BY STANLEY GIBSON
CW STAFF

Can the No. 1 desktop vendor be the one that offers mainly connectivity — not hardware or software?

Digital Equipment Corp. believes the answer is yes, and it said last week that in a year or so, that strategy, anchored by Decwindows, will carry the company to the top of the desktop heap. DEC announced that Decwindows, already shipping in DEC's Ultrix 32 Version 3.0, will be included in its Release 5.1 of VMS, due to ship in February.

In preaching the connectivity gospel, DEC President Kenneth Olsen reiterated a position he has expressed numerous times previously: that DEC would not innovate standard desktop hardware or software but would tie disparate desktop devices together.

Such a strategy is far from new. In 1986, the company gave birth to the Vaxmate, a Microsoft Corp. MS-DOS system that had built-in communications capabilities. That system failed to capture the market's imagination, however.

But if connectivity alone will propel DEC, much of the required software is not there yet and will not be announced until later this year at the earliest. Indeed, much of what was described last week remains only conceptual for now.

Ken Olsen *preaches the connectivity gospel*

For example, "live link," a capability of DEC's Compound Document Architecture (CDA), can update a document in one user's application from a document in another user's application. But two software packages offering the capability, Decwrite and Decdecision, will be not be available until May.

The ultimate goal of CDA is to offer instant updating of a document from information in remote databases and spreadsheets, but no databases or spreadsheets now comply with CDA specifications, according to DEC officials, who gave no date for when the products will.

However, 15 independent software vendors have endorsed CDA and are said to be developing CDA-compliant software.

Another missing building block is MS-DOS-based Decwindows, which is not offered on a standalone personal computer. Instead, it will only be offered on a server for PCs, effectively turning the PC into a dumb terminal. A user would have to exit the MS-DOS application to operate in Decwindows from the server. MS-DOS Decwindows Display Facility, which would allow this, has no price or shipping date.

"I've got problems with MS-DOS not being on a PC. A user with a lot of PCs on a LAN may not want a server," said Frank Dzubeck, president of Network Communications Architects, Inc. in Washington, D.C.

However, Richard Treadway, Decwindows program manager at DEC, said the company considered bringing Decwindows to MS-DOS PCs but did not because of the large amounts of added memory that would be required.

In addition, the X-library of applications would be difficult to implement in MS-DOS. "We didn't think there would be enough demand," Treadway added.

Under VMS, the recommended minimum amount of memory in a Vaxstation to run Decwindows and several applications is 4M bytes. Under Ultrix, the recommended minimum is 6M bytes. In a VMS-based server, the recommended amount is 8M bytes, according to DEC.

Decwindows *features multiple windows and services*

Sun reads DEC move as flattery by imitation

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Faced with its most formidable challenge yet in the engineering workstation market, Sun Microsystems, Inc. nevertheless expressed confidence last week that it will remain the industry leader despite an onslaught by Digital Equipment Corp.

"It's an endorsement of our strategy of open systems and Unix," said Cheryl Vedoe, director of marketing for workstations. "DEC finally realized that its strategy of the past — proprietary architecture and operating systems — is not viable."

However, Vedoe noted that Sun's product line remains broader than DEC's and that DEC's operating system strategy is "confused."

Sun's stock falls

Sun, which saw its stock fall a couple of points as a result of the announcement by No. 2 workstation vendor DEC, was scheduled to meet with financial analysts Thursday to quell any fears in the Wall Street community.

Rumors swirled that Sun would schedule a counter-announcement next month. Sources said Sun is likely to introduce a long-awaited Motorola, Inc. 68030-based workstation. However, a "Sparcintosh" — a workstation based on Sun's Scalable Processor Architecture (Sparc) and able to run a user-friendly version of the Unix operating system, Microsoft Corp. MS-DOS and IBM OS/2 — will likely come later, sources said. That will be Sun's first workstation for the retail market.

Already being called the Sun Killer by industry pundits, the Decstation 3100 is based on reduced instruction set computing (RISC) and runs DEC's version of the Unix operating system. It offers 14 million instructions per second (MIPS) of performance at a price of $11,900 for a diskless version.

In comparison, the Sun-4/260, also a RISC-based Unix machine, offers 10 MIPS of performance and starts at $39,900.

"This means that Sun has a real competitor," said Cindy Thames, vice-president at the Technology Research Group, a Cambridge, Mass.-based market research firm. "There are a lot of VAX users who are more comfortable buying from Digital."

Chip

FROM PAGE 1

AST Research, Inc., Hewlett-Packard Co., Sun Microsystems, Inc. and Digital Equipment Corp. — have not committed to bringing those prices down again.

"We just can't make that kind of promise," a DEC spokesman said. That sentiment was expressed by a half-dozen other systems vendors.

With the exception of IBM, which manufactures much of its own 1M-bit memory components, an aggregate system price erosion at an average of 12% to 15% is in the offing, said John Dunkle, vice-president of Work Group Technologies, a PC market research group based in Exeter, N.H. However, users will have to wait for a "ripple effect" to occur, he added.

"I expect the market to reflect the DRAM price drop in the next couple of months," said Jonathan Nareff, data center manager at Combustion Engineering, Inc. in Windsor, Conn.

PC prices should come down, but not by much, said Fred Stuart, director of corporate information services at Phelps Dodge Corp. in Phoenix. "There is still too much high demand for high-memory systems like the PS/2," he said.

But because memory is often loaded at the retail level, PC prices can drop quickly, said Jim Ashbrook, senior vice-president of marketing at AST Research in Irvine, Calif. Memory installed by the retailer could decrease almost in sync with DRAM price cuts. At the same time, it takes up to 120 days from the time memory is purchased to the time a change is reflected in the base system price, Ashbrook said.

Bruce Grant, vice-president of technology at Microage Computer Stores, Inc. in Tempe, Ariz., charged that it will be up to the vendors to show a good-faith price reduction. They "now have to pay a price for making a show of the memory price increase," he said.

Memory prices will take a dramatic dive this year for three reasons, said Drew Peck, semiconductor analyst at Donaldson, Lufkin & Jenrette, Inc., a technology research group based in New York.

First, 256K-bit memory chip manufacturing lines will have been successfully converted to build 1M-byte chips by the middle of the year, he said. Second, semiconductor manufacturers that have ramped up at breakneck speed will now glut the market, resulting in a price war. Finally, many vendors devastated by the shortage will overstock memory to avert any future crises.

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Computerworld (ISSN 0010-4841) is published weekly, except: (6) issues in February, May, August and October, (5) issues in January, March, April, June, July, September and November and (4) issues in December with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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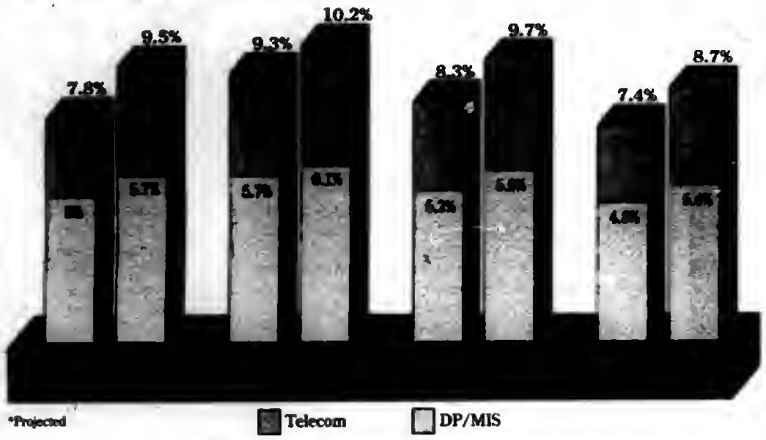
TRENDS

Telecom and MIS

Growth in telecom spending to outpace that of MIS in all sectors

PERCENT OF TOTAL OPERATING BUDGET BY INDUSTRY SECTOR



Ever since divestiture, telecommunications has played an increasingly crucial role in the competitive plans of Fortune 1,000 firms and other large users, according to a study by The Eastern Management Group.

Of the MIS and communications managers surveyed at 12,000 organizations, 27% said that they anticipated telecommunications personnel and budget outlays to grow between 10% and 50% during the next five years. Some 13%, representing the largest companies, anticipated a growth of 50% to 100%, the study found.

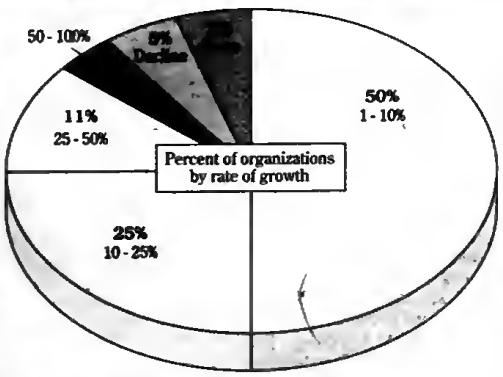
Telecom executives said they expected their budgets' percentage of overall corporate budget to grow from 2.8% to 3.8%, on average, by 1993. In contrast, data processing/MIS managers predicted a growth of from 5% to 5.7% for their departments during the same period.

A reflection of telecommunications' increasing strategic importance is the fact that in 1988, three-fourths of major companies had placed the function under DP/MIS, the report said. This also points to increased integration of voice and data operations, according to the study. Before divestiture, 42% of the study group had housed telecommunications within administration and human resources.

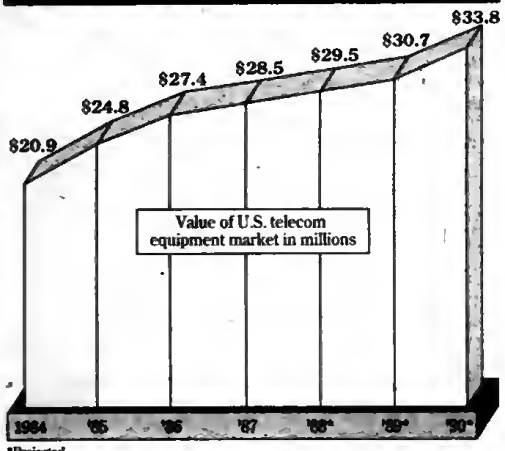
The study also found an accelerating trend of decentralization of telecommunications and information systems operations, tying these departments' operations more directly to individual business units.

ELISABETH HORWITT

Almost all telecom budgets get boost



Market forecast echoes spending hikes



SOURCE: THE EASTERN MANAGEMENT GROUP AND THE NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION
CW CHARTS: FRANK C. O'CONNELL

INSIDE LINES

The low end without Lowe. IBM will hold a product blitz this spring for its low-end systems, its first major announcement after the departure of former low-end systems President William Lowe, according to sources. The PS/2 line is to be enhanced at almost every price point, and a PS/2 incorporating the Intel 80386SX microprocessor and AT bus should be introduced as well. IBM will make available bus mastering cards that were demonstrated at Comdex/Fall '88 and is also expected to announce third-party bus mastering cards. The Armonkees are also expected to announce applications developed by third-party vendors for PCs running OS/2 that will be sold under the IBM label.

Listen to what we say, not what we say. A Radio Shack spokeswoman apparently misspoke when she was quoted here last week saying that DEC's OEM versions of Tandy's PCs are "Digital's in name only." Ed Juge, director of marketing at Tandy, last week said the comment was unfortunate and inaccurate. As with any OEM customer, DEC is free to "add or subtract features," and it would be surprising if the company merely relabeled the Tandy boxes, he said.

What is IS? The desire to polish the image and expand the role of the computer management profession meant changing the department name from data processing to management information systems and lately to just "information services." Could that lead to confusion? Well, if you spotted the newspaper help-wanted ad for a "Director of Information Services" at Merck & Co., it may have. According to the fine print, IS in this case is actually (shudder!) public relations; the top computer executive at Merck is the vice-president of "computer resources."

No show, no refund! One notable no-show at Comnet will be DEC, which canceled a 2,000-square-foot booth too late to save its $56,000 fee, according to company spokeswoman Pam Lattimer. A companywide reevaluation of marketing strategy resulted in the decision to focus more on DEC-sponsored shows such as Dectop and Decworld, she added. DEC will not be exhibiting at the Interface conference in March, Lattimer said, and the company may also bow out of the Comdex/Spring '89 show, rumor has it.

Follow the leader. Don't be surprised if Texas Instruments surfaces this spring with a 4M-bit/16M-bit token-ring dual chip set. A source says third parties have been beating up TI over this issue, given that IBM's chip supports these capabilities. IBM is also expected to come up with a very cheap, plain-vanilla 4M-bit Token-Ring board, according to a source.

Slip-sliding away. In a February 1988 announcement, Microsoft slated its Unix port of OS/2 LAN Manager, LAN Manager/Xenix (LM/X), for an early 1989 release, preceded by a software developer's kit that was to ship by the end of last year. In an update, Paul Sribhibhadh, Microsoft's director of Xenix marketing, says early LM/X code has shipped but that the developer's kit will be late. It will not be available until Uniforum in late March. The release was delayed to incorporate TCP/IP transport software, he said.

Open and shut. The graphical user interface recently announced by the Open Software Foundation (OSF) left out a key piece that was widely expected to be included: Adobe's Display Postscript imaging model. Apparently, Adobe did not agree to the OSF's licensing terms, and a suitable pact was not worked out by the Dec. 30 announcement. However, both parties confirm that they are still negotiating.

With no snow in the Northeast, Massachusetts high-tech execs are apparently thinking summer. Jim Manzi, chairman of Lotus, paid $4 million for a beachfront home on Cape Cod, according to published reports. Apollo Chairman Thomas Vanderslice is going downscale, reportedly negotiating for a $2 million cottage on the Cape. If you've got any reason to believe these guys or any other execs are thinking retirement instead of summer, give the hot line a call at 800-343-6474 or 508-879-0700 and tip off News Editor Pete Bartolik.

Whatsnot

From the advanced design studios of sunny Southern California comes a new version of super performance. New breakthroughs in lightweight materials give pedal pumping a technological twist. New designs on the boards feature superlight aluminum alloys and carbon skins. The rough angular shapes of traditional bike frames, pedals and gears are giving way to sleek contours that rival those of an exotic Italian sports car.

Of course the high-performance rider needs the right equipment. Advances in rugged yet lightweight clothing have resulted in windproof gear that offers an incredible degree of functionality with a minimum weight penalty. New breathable fabrics in a vast array of colors allow you (Cont.)

The right gear enhances your performance, whatever your destination

Performance Art.

V-RAM VGA. The art of high-performance desktop publishing.

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V-RAM VGA makes an art of outshining standard VGA on every front. It delivers super-crisp resolutions up to 1024 x 768 in four colors, or 640 x 400 with 256 colors. Add our 256K upgrade to capture 16 colors at 1024 x 768, and get a flicker-free, non-interlaced picture. Or draw an amazing 256 colors at 800 x 600. Either way, you'll achieve performance that rivals professional systems costing thousands more.

The Art of Speed.

You haven't a spare nanosecond to wait for your card to update the screen. So we made V-RAM VGA the fastest you can buy—up to four times faster than standard VGA boards.

The Art of Compatibility.

V-RAM VGA is 100% register-level compatible with IBM VGA. And guaranteed 100% compatible with all your current and future VGA software. Including OS/2.

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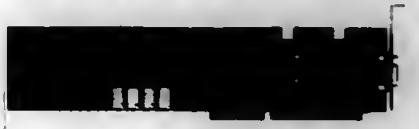

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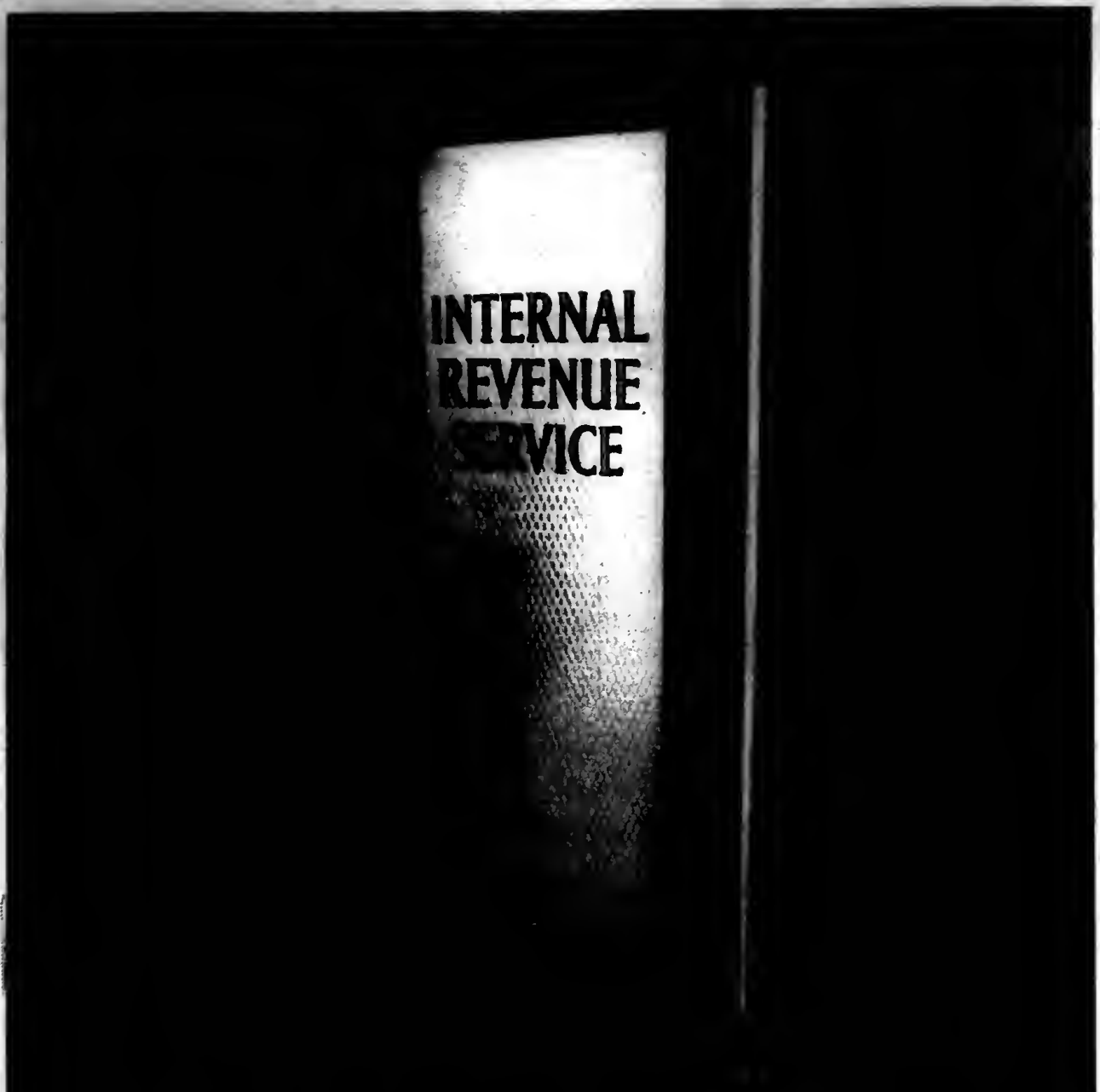

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